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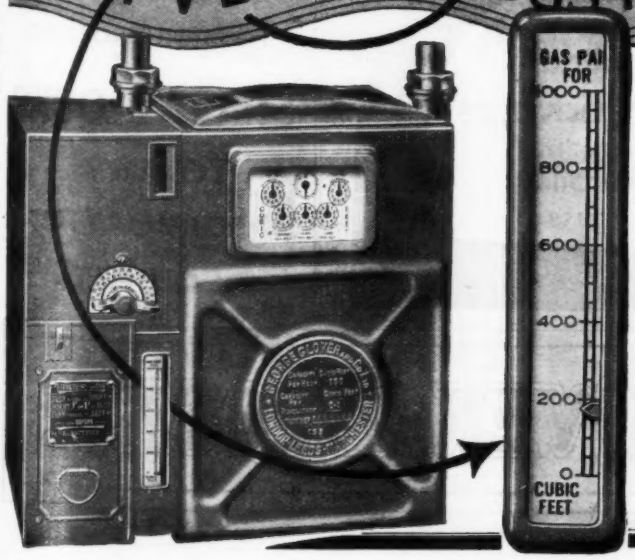

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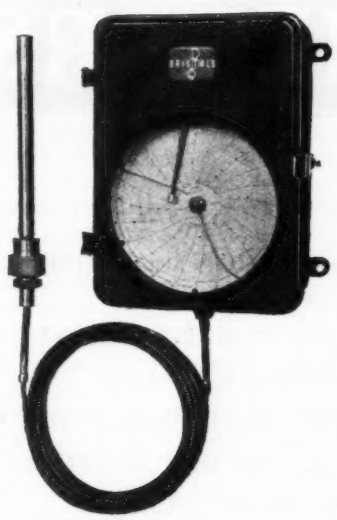

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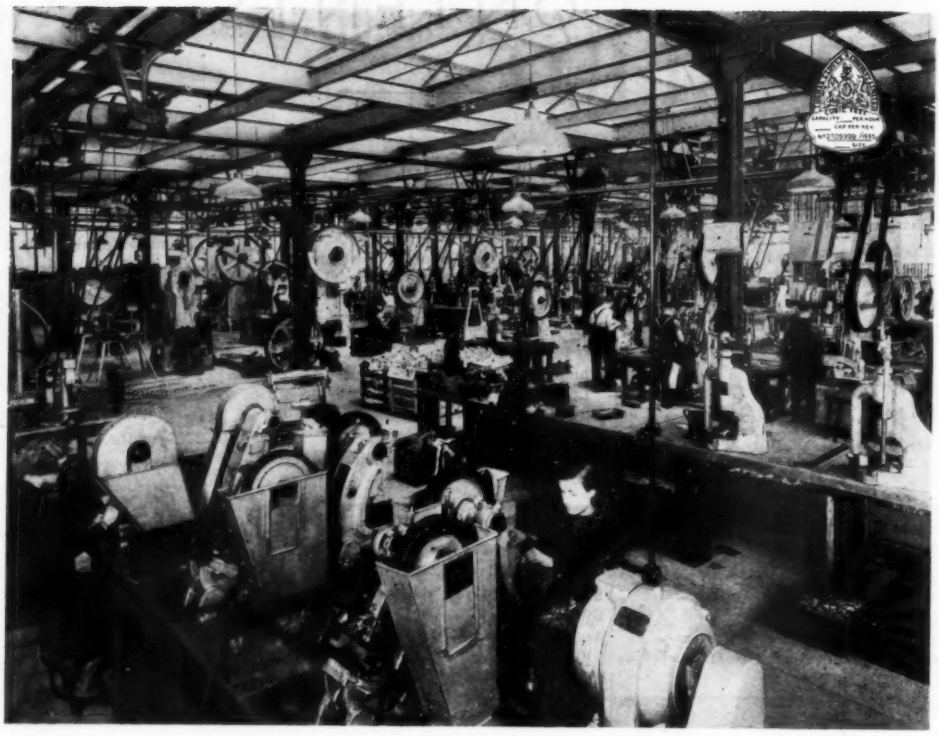

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Gas Journal

JULY 10, 1935

Vol. 211. 87th Year No. 3764

Editorial Notes

Promotional Rates

"THE position to-day is that the public are prepared to extend the use of gas if they can do so at lower rates than those now being charged, while gas undertakings are in a position to reduce the rates without loss of revenue if they could be assured of increased consumption. Clearly it is for the supplier to make the first move, which means that he must determine the annual sum which he is prepared to risk in his endeavour to extend the demand for gas." This quotation from an Address by Mr. E. J. Fottrell, of the National Gas Council, at a recent meeting of the North Wales Gas-Works Undertakings Association ("JOURNAL" for June 19) expresses what we have been at pains to emphasize on several occasions. The supplier must make the first move, and it becomes increasingly obvious that to cling to the flat rate is unsafe from a revenue-producing point of view. No one in charge of a gas undertaking should regard his existing business as secure. The risk of losing that business is ever present.

For which reason we are glad that in recent issues of the "JOURNAL" we have been able to record the activities of several new recruits to the band of those who have adopted promotional tariffs. Among the new recruits are Bolton, Coatbridge, Cleethorpes, Dewsbury, and Dumbarton, and they represent a wide variety of method. Many more recruits are urgently needed, and those who are pondering the matter will find the Paper which Mr. W. B. McLusky presented to The Institution of Gas Engineers last month, and the animated discussion to which it gave rise, of the utmost service, as also they will find the Memorandum on Methods of Charge prepared by the National Gas Council and recently issued with the approval of the Joint Co-ordinating Committee. The pioneer work of Mr. McLusky on this vital question of tariffs to retain existing and secure new business has been of the greatest value to the Gas Industry. For many years he has not only advocated the introduction of alternative tariffs, but he has put them into operation while others have not taken the plunge. In the discussion on "The Gas Account," Mr. George Evetts criticized Mr. McLusky's variety of scales on the score that they are complicated and confusing when simplicity should be the aim of the Industry. He is of opinion that we are dipping into as many forms of tariff as the electrical industry, so that we may find it necessary to appoint a committee to eliminate the many variations and to get back to comparative simplicity.

Variety of Charging Systems

To those seeking the right tariff the variety of methods of charge already adopted and in operation is certainly bewildering. This is instanced by the undertakings we have mentioned in referring to new recruits. Bolton, for example, follows the Newcastle model. It is a block system embodying three factors—the number of rooms on the premises, summer and winter consumption, and discount. There are three blocks, and the amount of gas which a consumer must use before the second and third block become operative depends on the number of rooms in his house and whether it is summer or winter. As an example, if a consumer has four rooms, then in summer he has to burn 9 therms a quarter at 9·6d. per therm before he comes on to the second block of an equal number of therms at the substantial reduction to 6·67d. per therm. All in excess is charged for at 4d. a therm, which is definitely a promotional rate. In winter he is charged at the first block for 18 therms a quarter and at the second block for the next 18 therms; he then comes on to the 4d. rate. Dumbarton has a block system based solely on consumption. The first block of 7,000 cu.ft. per quarter is at 7·06d. per therm, the second (7,000 to 50,000 cu.ft.) at 4·7d. per therm. Coatbridge, Cleethorpes, and Dewsbury have two-part tariffs. The service charge at Dewsbury is based on the rateable value of the premises, and the commodity charge is 3d. a therm, as also is the commodity charge at Coatbridge. At Cleethorpes—a Company Undertaking—Mr. Brockway has a service charge of 5s. a month and supplies gas at 5d. per therm, with ½d. discount for monthly payment within ten days. There is plenty of variety in these few examples, but the great point is that all these scales encourage consumers to extend their use of gas service, which the flat rate does not.

In this regard we were very interested in the results of the Rotherham Gas Department for the last financial year. Gas sales increased by over 14%. Rotherham is, of course, exceptional in the low price at which it can supply coke oven gas, but it is enterprise as well as price which has effected such an excellent and enviable growth

in output. There is, says Mr. J. T. Haynes in his annual report, a steady increase in the number of domestic consumers who are using gas to provide hot water and for other heating purposes. Though, as was to be expected, most of the increase is accounted for by industrial sales, there was a growth in domestic demand of 2%, in spite of a loss of some 11 million cu.ft. to electric lighting through slum clearance and the appeal of the assisted wiring scheme. The two-part domestic tariff, he believes, has been largely responsible for this development, over 1,000 consumers having already signed agreements for supply in this way.

The First Block

We think it would be helpful if we epitomized a few of the views—many of which were conflicting—in regard to gas pricing which found expression at the Institution Meeting and in Mr. McLusky's written reply which appeared in our Third Institution Number last week. The majority ruling is that the flat rate is, or ought to be, dead. A dissenter from the two-part tariff, however, is Mr. Curtis, of Macclesfield, who argues that if a two-part tariff is highly successful it may be found that the many small consumers are subsidizing those on the tariff scheme. He argues that the adoption of a two-part tariff tends to make summer and winter loads more divergent, in which case, unless there is surplus plant, it would necessitate capital expenditure to accommodate the excessive peak load and for which there would be no corresponding allowance made in the commodity charge. We cannot agree that these arguments have sufficient weight to prevent the introduction of two-part tariffs. Generally speaking we can afford to give additional supplies of gas at considerably reduced rates. They do not normally involve increased capital or management costs, and for our part we should look to the present possibilities of increased sales rather than to future extensions of plant. Such extensions may demand modification of the tariffs, but the immediate problem is to gain business. Again, the small consumer is not necessarily the "poor" consumer. Often he is quite well-to-do and regards his gas supply in the light of an occasional convenience, and is already subsidized by the consumer who uses gas more liberally. On this question of "additional" business, Mr. Ingham, of Brighouse, has a pretty argument. He observes that, generally speaking, it costs us about 4d. per therm to supply additional demands for gas and we charge in round figures about 8d. a therm—a profit of 100%. This is not the way to obtain the additional load we are seeking. His plan—and there is good reason to support it—is to increase the price for the first few therms consumed per quarter. He has taken this courageous step and is now charging 10·8d. a therm for the first 5 therms, 7·2d. for the next 10, and all in excess at 4·05d. per therm. The result is that he can get down to bed-rock competition and can quote prices practically competitive with coal. The unremunerative consumer does have to pay a little more for his gas, but the increase, in view of the small amount of gas he consumes, is correspondingly slight.

The Demand Charge

In the few examples quoted above, we find tariffs based on rateable value, "assessable" rooms, consumption, and a direct and general charge such as the 5s. a month at Cleethorpes. We also have the different assessments in winter and summer. Then, at Halifax, there is the rate based on the floor area of the rooms in the premises. As we have said, here is bewildering variety, and dogmatism as to what is the best tariff is quite out of place. The perfect tariff is not as yet, and we think it will never eventuate. Any tariff is a compromise between policy and economics. At the Institution Meeting Colonel Carr joined Mr. Evetts in his plea for simplicity in formulating rate structures. He does not agree with grading the service charges on the basis of floor area, number of rooms, or rateable value. The demand charge, he maintains, should be based on the standing charge to the undertaking, and in formulating any tariff care should be taken to differentiate between domestic and large industrial consumers. In his opinion, with the bulk of domestic consumers it is practicable to assess the demand charge on a fixed basis, and consumers in premises of more than a certain size can then be assessed on the basis of demand by the appliances installed. His point is that the fixed basis of determining the demand charge is much more likely to induce the consumer to adopt the two-part tariff than if he were assessed on a factor having nothing to do with the cost of supplying him with gas. Colonel Carr makes a service-rental charge of 10s. per quarter for domestic purposes, though, as stated, this does not apply to all the houses in his area. Mr. McLusky admits the simplicity of this plan, but regards its working as being unjust, for the cost of providing for the consumer's demand depends on the maximum requirements of the consumer and the particular incidence of this demand.

Individual Action Needed

There is plenty to think about, a wealth of suggestion, in Mr. McLusky's Paper and the discussion which ensued. Here surely is enough evidence of the need for scrapping the old flat rate system. That is one conclusion to be drawn; the other is that each undertaking must in this matter of rate structures work out its own salvation. There is the Institution Meeting to help, and in addition to the National Gas Council's Memorandum we have had the assistance lately of two other important Papers—one by Mr. Ridley ("Journal" for May 8), the other by Mr. Scarth ("Journal" for Feb. 27). The circumstances of different undertakings vary so widely that each must determine for itself the most appropriate form of charge and must not be misled into adopting some particular rate because it may be shown to have been successful elsewhere. This point was emphasized by Mr. Fottrell in his Address in Wales. For example, some undertakings supplying holiday resorts experience their daily and hourly peak demands in the summer time, and the rates which such undertakings can afford to offer for space heating and public lighting are lower than those which could be offered by an undertaking experiencing a winter peak. Even in the case of undertakings similarly situated, both geographically and in relation to the nature of the population served, differences occur in the amount of capital charges which have to be met. Also, the form of price and dividend control varies between one undertaking and another.

The 4,000 B.Th.U. Gas Unit

One of Mr. McLusky's scales of charges is based on the gas unit of 4,000 B.Th.U., which at the declared calorific value at Halifax is equivalent to 10 cu.ft. of gas. Naturally this topical question of the gas unit, which is so closely related to the problem of pricing, came up for discussion. Would it not be better, asked Mr. McLusky, to quote ½d. a unit rather than 4s. 2d. per 1,000 cu.ft. For central heating, water heating, and other purposes for which gas may be required for long periods, or in the

evening or night-time, Mr. McLusky offers gas at prices varying from 0·27 to 0·12d. per unit of 4,000 B.Th.U., depending upon the number of hours the gas is in use. Mr. Ridley, however, prefers to stick to the therm, in the belief that to charge by units would cause confusion in the minds of the public. In the discussion on Mr. McLusky's Paper he mentioned that in one known case the gas tariff would not show a reduction until 25,000 units had been consumed, while the electrical competitor in the same district advertises in his tariff for the same purpose that the consumers will obtain reduction after consuming 200 units. In another known case the figures are 750 units and 32 units respectively.

In this regard, however, it is interesting to translate into "unit" sales talk the domestic tariff which Mr. Ingham has introduced at Brighouse and to which reference has been made in the foregoing. The first 125 gas units would cost 0·43d. per unit, after which there would be a reduction to 0·28d. per unit for the next 250 units, while all in excess would cost only 0·16d. per unit. We should like to see any electricity tariff which could compare with this, bearing in mind that there is no service charge in the Brighouse gas tariff. To test whether the gas unit had advantage as a selling point, Mr. McLusky recently made enquiry in a business house in London as to the prices charged for gas and electricity. He was promptly told that the price of gas was 8d. and the price of electricity ½d. Neither therms nor units were mentioned, and the information was given in the head office of a firm whose business is the organization and equipment of offices with costing systems. Had the price of gas been expressed in terms of units, remarks Mr. McLusky, the answer would not have sounded so prejudicial to gas.

We may mention that Mr. Braidwood, of Coatbridge, has introduced the gas unit of 4,000 B.Th.U. with his two-part tariff, and can quote the low commodity charge of 0·12d. per unit for domestic purposes. He regards this as an excellent selling point. As for Dewsbury, it is four years since Mr. Bateman adopted the 4,000 unit, so that with his new two-part tariff he too can quote a similarly low price per unit.

Ammonia and Tar

In the past ten years there has been a decrease of 269, or 48%, in the number of plants in England and Wales registered for the production of sulphate and muriate of ammonia. During 1934 there was a decrease of 15. These statistics are contained in the Annual Report on Alkali, &c., Works which has just been published by H.M. Stationery Office. Mr. Damon, Chief Inspector for England and Wales, states that most of the small plants are now becoming derelict for, although prices have improved, they are still low unless the manufacturer is fortunate enough to command a local sale. Lack of co-ordination between acid manufacturers and sulphate producers has allowed the market, in some cases, to be lost. He mentions, however, that the encouragement given by the Ammonia and Effluents Committee of The Institution of Gas Engineers to the concentration of gas liquor for subsequent delivery to central fertilizer works is gradually having its effect. We have for long maintained that the salvation of the ammonia situation lies in concentrating gas liquor. In 1934 there was an increase of six in the number of undertakings where such concentration is practised, and we are glad that a considerable increase is anticipated. Concentration plant may not appear attractive to works favourably placed as regards disposal of ammoniacal liquor via the sewage works, but such undertakings may be reminded of the figures given by Mr. Parrish at the last research meeting of the Institution. He gave the cost of production as 5-6d. per unit of ammonia, and the selling price of concentrated liquor as 1s. 3d. per unit, governed by a sliding scale. Our pages have lately contained plenty of evidence to reassure those who are frightened of the capital cost and operating charges of concentration plant; and it is good to note the following from Mr. Damon's report: "The indications are that the policy of wasting ammoniacal liquor is losing favour, if, indeed, such policy is not actually being reversed."

Dr. Birkett Wylam, Chief Alkali Inspector for Scotland, also refers in his report to the fact that during the year under review several new gas liquor concentrating plants have been installed, and he mentions in this connection a modification of plant which has proved very successful in preventing fume emission. With this alteration a reasonably large stream of weak liquor can be circulated through the final scrubber and returned to the liquor feed tank, and the plant runs more uniformly. Moreover, the efficiency of the process is increased, for the weak liquor absorbs ammonia and returns it to the system. Previously this had been lost through passing to the purifiers along with the foul gas. Dr. Wylam reports that, as compared with the previous year, ammonia production in Scotland has shown an increase of some 10%, the greatest increase being in material manufactured in coking plant. At the end of 1934 all Scottish coke ovens were working to maximum capacity. In regard to the emission of "green gas" from coke ovens Mr. Damon says that a double collecting main seems to be almost essential if the ideal is to be attained, but much improvement might be effected at many ovens without going to this expense. "Anyone," he observes, "who has witnessed the charging of ovens in different localities cannot fail to be struck by the great variations in the volume of smoke emitted, and often the worst cases are due to carelessness or indifference. In my opinion this matter is a reproach to an industry which prides itself on being progressive and efficient, as, indeed, it is in other respects."

Removal of H_2S

In his last report Mr. Damon called attention to a tendency at certain gas-works to use in the sulphate of ammonia purifiers oxide which has previously been employed for the purification of coal gas. He pointed out that the hydrogen sulphide content of crude coal gas is of the order of 1%, while that of saturator gases is about 20%. Moreover, at a sulphate plant it is customary to employ only one purifier at a time. In the present report Mr. Damon remarks that there have been fewer instances where Inspectors have had occasion to complain of ineffective oxide purifiers, and the practice of using fresh oxide for replenishment is increasing. Where this is inconvenient, the oxide is renewed when it attains a sulphur content of 30%. Beyond this stage frequent revivifications are necessary. The suggestion has been made that when the oxide has reached a sulphur content of 30% it should be removed to the coal gas purifiers, where it can readily be worked up to a sulphur content of 50% or more. In spite of the improvement, however, the Chief Alkali Inspector observes that there is still a tendency to underestimate the danger of hydrogen sulphide. Possibly owing to its being relatively a waste product, its removal from foul gases is not always accomplished with the care and thoroughness which are essential.

Reference is made by Mr. Damon to the fact that the smaller independent tar distillers continue to find diffi-

culty both in securing supplies of raw tar and in disposing of their products. Highway authorities, in demanding standard products of high quality, tend to rely more on the larger distillers at whose works there is greater technical control. While the requirements for road tar were below expectations, and the price of pitch fell, the demand for creosote has been "quite exceptional." This demand has, of course, been stimulated by the tax on petroleum fuel oil and the requirements of the hydrogenation process. As for benzole, its extraction from coal gas continues to grow in favour. The number of processes registered in England and Wales under this heading in 1934 increased by 46.

On a later page will be found an extract from the report giving statistical information of ammonia products manufactured and tar treated in England and Wales and in Scotland during 1934. It will be noted that the ammonia products (expressed as sulphate, 25¾% NH_3) manufactured from gas-works liquor increased from 89,500 tons in 1933 to 102,300 tons in 1934, the corresponding figures for Scotland being 11,205 tons and 12,269 tons.

Gas at "The Royal"

TWELVE months ago we had occasion to congratulate the Ipswich Gas Light Company on the splendid showing they gave to gas at the Royal Agricultural Show held in that town. This year the Show moved north, and the cudgels were taken up with equal vigour and success by the Newcastle-upon-Tyne and Gateshead Gas Company, who utilized their travelling gas showroom to excellent effect for bringing the merits of gas prominently before the public eye. An illustrated description of their display appears on a later page of this issue and incidentally demonstrates the versatility of the "showroom on wheels."

There are many visitors to "the Royal" who are definitely potential consumers of gas, but who are difficult to attract by the ordinary methods open to the gas salesman, while some idea of the scope for gas propaganda may be obtained from the fact that on Thursday of last week no fewer than 38,892 persons visited the Show. In addition to a display of domestic gas appliances to provide a centre of attraction for the "lay" visitor, the Newcastle Company's exhibits were peculiarly suited to the nature of the Show, with its agricultural associations. For instance, there were specialized exhibits of the use of gas on the farm and in the dairy, including bottle sterilizers, steam jacketed milk-boilers, gas engines for hay chopping, corn crushing, &c., as well as greenhouse heating equipment—to name but a brief selection of the many appliances displayed.

Furthermore, it is gratifying to note that gas was used for a hundred-and-one other jobs in connection with this important annual event, entailing the laying by the Company of 15,000 ft. of piping. Once again the Gas Industry can congratulate itself that its interests were in such capable hands, and be grateful to the Newcastle undertaking for shouldering the responsibility in so thorough a manner.

Personal

Among the names of the new Justices of the Peace for the County of Banff is that of Mr. LEWIS BAIN, who is, of course, Engineer and Manager of the Cullen and Banff Gas Undertakings and immediate Past-President of the North British Association of Gas Managers.

* * *

Mr. P. GILBERT, of Nottingham, has been appointed Solicitor on the staff of the Sheffield Gas Company. For the past six years Mr. Gilbert has been with Messrs. Robert Barber & Sons, of Nottingham, and previously held appointments with Messrs. Rowley, Ashworth, & Co., of Manchester, and Messrs. Tatham Worthington & Co., also of Manchester. Mr. Gilbert was educated at Oldham (Hulme) Grammar School, and holds the London University degree of LL.B. He served his articles with a firm of Solicitors in Oldham.

* * *

Members and officials of the Newcastle (Staffs.) Town Council, at the meeting of the Council last week, presented a silver tray to Mr. C. LOVERIDGE, who recently retired from the position of Manager of the Chesterton Gas-Works, which he had held for 23 years.

The presentation was made by Alderman R. Beresford, Deputy Mayor of the Borough, and Chairman of the Gas Committee, who paid tribute to the work of Mr. Loveridge. Reviewing the progress made at the Works during Mr. Loveridge's period of service, he said at the commencement they were almost derelict, and now they were in good working order. He expressed the best wishes of the Council and officials to Mr. and Mrs. Loveridge. Tributes were also paid by the Mayor (Mr. J. Bentley), Mr. F. L. Wimhurst (Gas Manager at Newcastle), and other members of the Council.

Obituary

The death occurred at Malton, Yorkshire, on Thursday last, of Mr. HENRY TOBEY, aged 93, for nearly half a century Secretary and Manager of the Malton Gas Company. Going to Malton from Worcester (where he had been under the tutelage of Mr. Deaks) in 1875, Mr. Tobey was appointed Secretary and Manager of what was then the Malton Gas Light and Coke Company, which position he held until his retirement in 1915. In addition to this position, Mr. Tobey, in 1890, with the approval of the Directors, became the Engineer to the Filey Water and Gas Company. In 1876 he joined the British Association of Gas Managers and the North of England Gas Managers' Association on its formation. Of the latter he was elected President in 1886, and again filled the office in 1911. He also represented the North of England Association on the Council of The Institution of Gas Engineers.

At the funeral at Malton on Saturday, the Directors of the Malton Gas Company were represented by Mr. H. Watson Pearson (Chairman); Mr. T. Law (Secretary and Manager) represented the Malton Gas Company and also the North of England Gas Managers' Association.

* * *

The death has occurred at Greenock of Mr. JOHN PATTERSON, a former Convener of the Gas Committee of the Greenock Town Council. When he settled in Greenock he evinced a keen interest in the affairs of the town, and in 1909 was elected to the Town Council, later being appointed to the Gas Committee, from which he retired eleven years ago.

New System of Charges at Bridgwater

The gas unit and a block system of charge have been introduced by the Bridgwater Gas Light Company, and a sheet giving details of the scheme and other relevant gas publicity has been published for circulation among their consumers. Below we are able through the courtesy of the Bridgwater Gas Light Company to publish details of the scheme:

Quarterly Consumption.

—	Units.	Cu.Ft.	Per Unit.	Per 1,000 Cu.Ft.	Per Therm.
			d.	s. d.	d.
Block 1 . . .	First 281	2,500	0·43	4 0	10·66
,, 2 . . .	Next 563	5,000	0·4	3 9	10·0
,, 3 . . .	,, 4,781	42,500	0·373	3 6	9·33
All over. . .	5,625	50,000	0·355	3 4	8·88

For areas outside the Bridgwater area of supply a corresponding reduction will be made on the present prices charged. Rebates will be increased to prepayment consumers in accordance with price reduction.

News in Brief

The Index to the "JOURNAL," Vol. 210, covering the April to June quarter of the current year is published as a supplement with this week's issue.

The Oldham Gas Committee have applied to the Ministry of Health for sanction to borrow £25,000 for the purchase of more gas cookers and gas fires.

The Ministry of Health has held an enquiry into an application by the Abertillery Urban District Council to borrow £21,850 for additional plant at the gas-works.

A De-greasing Plant for the renovation of cookers is to be purchased by the Motherwell Gas and Wishaw Gas Department. The I.C.I. plant has been selected at a cost of £90.

The Haworth Urban District Council have reduced the price of gas by an all-round cut of 2d. per 1,000 cu.ft., bringing the price within the Council's district to 2s. 2d. and that for the rest of the area to 2s. 8d.

Applications are Invited for the position of Executive Officer and Secretary of the Scottish Executive Board of the National Gas Council, at a commencing salary of £450 a year. Further particulars will be found in our advertisement columns this week.

The Stoke-on-Trent City Council have decided to make a grant of £250 to the Gas Engineer (Mr. A. Mackay) as a mark of appreciation and in acknowledgment of the special services rendered by him in connection with the centralization, extension, and development of the Gas Undertaking.

The Galashiels Gas Light Company have reduced the price of gas by 1d. per 1,000 cu.ft., making the price to ordinary consumers 2s. 11d. per 1,000 cu.ft., less 15% discount to power and trade consumers, and to consumers by prepayment meters (including meter rent) 3s. 4d. per 1,000 cu.ft.

European Gas Company, Ltd.—Stockholders representing more than the requisite 75% of the nominal capital having accepted the offer of Messrs. R. de Lubersac et Cie., the agreement has now become absolute. A circular will be addressed to stockholders at the earliest possible moment.

The Annual Outing of the employees of Dougall's Gas Meters, Ltd., took place on Saturday, July 6, when a party of fifty visited Bournemouth. After luncheon at the Corner House Restaurant, at which Mr. R. V. Steed (Managing Director) presided, visits were made by steamer to Swanage and the Isle of Wight.

The Wallasey Corporation has decided to appoint a special Committee of nine members to report to the Council upon the desirability of passing a scheme for the purpose of avoiding unnecessary competition and establishing co-ordination of working between the Gas Committee and the Electricity Committee.

Petitions Signed by 455 Residents have been sent to the Sale U.D.C. protesting against a proposal to erect a gasholder on a site in Dane Road instead of on land owned by Stretford and District Gas Board in Glebelands Road. The Council has decided to write to the organizers of the petition explaining the reason for the Council's decision.

It Was Stated at the Ministry of Health enquiry at Thornton Cleveleys last week that gas-works extensions would be required in the near future. At the moment the Council were disturbed at the high cost of transport of coal which amounted to about £1,000 a year. To obviate that it was proposed to run a private siding alongside the Works.

A Correction.—In Mr. W. B. McLusky's written reply to the discussion on his Paper, "The Gas Account," before The Institution of Gas Engineers the figure of 6d. per unit ("JOURNAL" for July 3, p. 36, 25 lines from bottom of column 2) should read 0·6d. The diagram referred to by Mr. McLusky on p. 37 of the "JOURNAL," column 2, line 10, is on p. 36 of his Paper.

Always Ready to Participate in any activity tending to encourage the use of gas for cooking, the Leeds Gas Department co-operated readily with the promoters of the first Leeds Bread Week—held in the week ended July 6, as part of the milling and baking trade's big five years' bread and flour publicity campaign now in progress. A feature of the "Week" was a series of lectures and demonstrations, by Miss Anne Baker, of the College of Modern Housekeeping, on the wide variety of attractive dishes to be made from bread and flour. The Gas Department furnished the cookers and fuel.

A Reduction in the Price of Gas has been decided upon by the Strabane U.D.C. by 3d., making a reduction of 6d. since the beginning of the year. The price in the town is now 4s. 6d. per 1,000 cu.ft. During the past year the Municipal gas-works at Strabane have shown a profit of close upon £500, the total output being approximately 2 million cu.ft. over that for the previous twelve months.

The Melrose Gas Company have decided to adopt the block system of charging for gas. The charge will now be 5s. per 1,000 cu.ft. instead of 5s. 10d. on each meter registering over 5,000 cu.ft. There will also be a further reduction to 4s. 2d. for consumption exceeding 20,000 cu.ft. In the case of coin meters, the present charge of 6s. 3d. will be reduced to 5s. on each meter registering over 5,000 cu.ft.

Birmingham to Borrow £146,000.—At the Birmingham City Council meeting on July 2, it was decided to apply for sanction to borrow £125,000 for provision of gas mains and services, £7,000 for a branch showroom and depôt at Northfield, £8,000 to cover the cost of purchase of 14,148 sq.yds. of land in Duddestone Mill Road, and £6,000 required to cover the cost of the purchase of the Coleshill Gas Company and incidental expenses relating thereto.

The Manchester and District Regional Smoke Abatement Committee have drafted a scheme for a proposed South-East Lancashire Joint Smoke Abatement Board, and at a meeting in the city it was approved in principle. The scheme has now to be submitted to the local authorities and makes provision for a joint board which would sub-divide the area concerned into fifteen inspectorial districts on the basis of the number of industrial chimneys.

Members of the Blackburn Unemployed Group were invited by the Corporation Gas-Works Sports Club to games of cricket and bowls, on July 3. While the Gas-Works won the bowling match 245-199, the unemployed were successful at cricket by 95 runs to 40. Cordial thanks were expressed to Mr. J. D. Ashworth (Gas Engineer and Manager), Mr. E. B. Field (Superintendent), and the Sports Committee for their kindly regard for the unemployed.

The Blackburn Town Council has approved the recommendation of the Gas Committee to increase the salary of Mr. J. D. Ashworth, the Gas Engineer and Manager, from £800 per annum to £1,000 per annum, by increments of £50 each. The Gas-Works staff is also to be reorganized. Mr. J. Pinkerton, Stores Clerk; Mr. G. Humphries, Technical Assistant; and Mr. E. Culshaw, Publicity Assistant, are to be transferred to a higher division at increased salaries.

The Ruhrgas Company, of Essen, Germany, reports a gross profit of 15,015,338 reichmarks for the last financial year as compared with 15,413,007 marks in 1933. After deduction of the operating costs and applying 8,124,996 marks to depreciation, the net profit amounts to 816,381 marks as against 1,322,744 marks in the preceding year. Of this sum, 702,256 marks are being placed to reserve and 50,000 marks to various employees' funds, leaving a balance of 64,125 marks to be carried forward.

Forthcoming Engagements

July.

17.—B.C.G.A.—Executive Committee Meeting, 11 a.m.; General Committee, 2.30 p.m.

18.—S.B.G.I.—Council Meeting at 56, Victoria Street, S.W. 1, 2.30 p.m.

18.—WALES AND MONMOUTHSHIRE ASSOCIATION.—Special Meeting at Cardiff.

22.—LONDON AND COUNTIES COKE ASSOCIATION.—Executive Committee, 11 a.m.; Central Committee, 2.30 p.m.

26.—I.G.E.—Liquor Effluents and Ammonia Committee, 11 a.m.; Joint Research Committee, 2.30 p.m.

30.—I.G.E.—Joint Lighting Committee, 2.30 p.m.

Sept.

9-12.—ASSOCIATION OF PUBLIC LIGHTING ENGINEERS.—Twelfth Annual Meeting and Conference in London.

12.—NORTH BRITISH ASSOCIATION.—Annual Meeting at St. Andrews.

A Scheme to Reconstruct the City's Gas Undertaking at an approximate cost of £89,000 was outlined before Lieutenant-Colonel L. F. Wells, at a Ministry of Health enquiry which was held at Salford Town Hall on July 2 into the application to the Ministry made by the Council for sanction to borrow the money. If the scheme is put into operation, the Corporation anticipates that there will be a net saving of about £7,000 a year after deducting interest and sinking fund charges on the borrowed money.

The Relative Merits of coal and coke fire grates were debated at a recent meeting of the Lees (Lancs.) Housing Committee. Mr. Parry, Commercial Manager of the Oldham Corporation Gas Department, wrote suggesting that a representative of the makers of coke-burning grates, along with a representative from the gas-works, should be allowed to meet the Committee before it was decided what type of grate should be fixed in the new houses being built by the Council. Councillor Jones said he had saved 1s. 1d. per week since he had had a coke fire installed. The coke fire was certainly better. Before a decision was made, the Clerk was asked to obtain particulars of the relative costs of coke and coal burning grates.

A Special Meeting of the Wales and Monmouthshire Association of Gas Engineers and Managers is to be held at the South Wales Engineers' Institute, Park Place, Cardiff, at 11 a.m. on Thursday, July 18 next. Papers by Mr. Oliver, of the B.C.G.A., and Mr. W. A. Harper, of the Horseley Bridge and Thomas Piggott, Ltd., will be presented in the morning, and after luncheon at the Park Hotel, by kind invitation of the Horseley Bridge and Woodall-Duckham Companies, the members will leave to visit the Cardiff East Moors Works of British (Guest, Keen, Baldwins) Iron and Steel Company, Ltd., to inspect the Klönne waterless holders and the coke oven plant at present in course of erection by the two firms previously mentioned.

The Stockport Gas Committee has received from the Engineer a report regarding the negotiations which have taken place with reference to the acquisition of the Poynton Gas-Works. The price fixed by the Poynton Collieries Company, Ltd., on the advice of a gas engineer acting on their behalf, was £15,600, *plus* a compensation figure capitalized at £1,225. It was resolved that the Corporation purchase the Poynton Gas Undertaking on the terms reported and that borrowing powers to cover the expenditure be obtained. When the Works are taken over they will be closed down and the area supplied by the Stockport Undertaking. The extended supply area embraces the districts of Adlington, Handley, Kettleshulme, and Lyme.

Gas Boiler Exhibits at the Royal Agricultural Show

A comprehensive exhibit of Ideal equipment was staged at the Royal Agricultural Show at Newcastle, comprising "Ideal" domestic boilers for hot water supply—including the new "Neo-Classic" boilers and radiators for central heating, "Ideal" gas boilers, "Rayrad" flat surfaced radiant radiators, and the "Cookanheat" for cooking, hot water supply, and radiators. "Ideal" towel rails in chromium and nickel-plated finish, and numerous radiators were also included. The majority of the boilers were shown in vitreous enamel finish.

In addition, there were shown "Britannia" boilers for central heating and also for horticultural heating.

Association of Public Lighting Engineers

Programme of Twelfth Annual Conference

A full programme, with much to interest members of the Gas Industry, has been arranged for the Twelfth Annual Meeting and Conference of the Association of Public Lighting Engineers, to be held in London from Sept. 9-12 next.

The President is Mr. A. M. Bell (Public Lighting Superintendent of the Tottenham and District Gas Company), and he will be supported at the Reception on the opening evening by Sir Francis Goodenough, C.B.E. He reads his Presidential Address on the Tuesday morning.

Among the Papers to be presented at the Conference is one by Mr. D. Chandler and Mr. A. J. Prestage (South Metropolitan Gas Company) on "Directional Lighting by High and Low Pressure Gas Lamps," and another by Mr. F. C. Smith and Mr. K. B. Sawyer (Gas Light and Coke Company) on "An Analysis of Modern Views on Street Lighting and their Relation to Visibility." On the Wednesday there will be a luncheon at the invitation of the Chairman and Directors of the Tottenham and District Gas Company, at which Mr. Henry Woodall will occupy the chair.

Amalgamation and Grouping

Caledonian Gas Corporation.

The Caledonian Gas Corporation, which has been incorporated with a view to assisting in the co-ordination and co-operation of gas undertakings throughout Scotland, has acquired holdings of over 93% in the shares of the following companies: Armadale Gas Company; Broxburn Gas Company, Ltd.; Lasswade and Bonnyrigg Gas Light Company, Ltd.; Fauldhouse Gas Company, Ltd.; Stane and Dykehead Gas Company, Ltd.; Leslie Gas Company, Ltd.; Irvine Gas Company, Ltd.; Girvan Gas Company, Ltd. In addition, approximately 80% of the shares and over 90% of the Debentures of the West Calder Gas Company, Ltd., have been acquired. The continued co-operation of the local Boards and managers is sought, but expert technical advice will be available for the individual companies.

The Board of the Corporation, which has registered offices at 4, Albyn Place, Edinburgh, consists of Mr. R. G. Simpson, C.A. (Chairman), who is identified with various investment and industrial companies; Mr. John R. Little, a Director of the Century Insurance Company, Ltd.; Mr. Richard Kidston Law, M.P.; and Mr. William Wilson, M.B.E., M.Inst.Gas E., M.S.E. (Technical Director), formerly Gas Engineer and Manager at Burton-on-Trent.

The capital of the Corporation consists of £900,000, divided into 312,500 4½% cumulative preference shares of £1 each; 187,500 4½% preferred ordinary shares of £1 each; and 400,000 ordinary shares of £1 each, of which 230,000 have been subscribed for in cash.

Permission to deal in the shares is to be sought in London, Glasgow, and Edinburgh.

The Women's Gas Council

The formation of the Women's Gas Council has met with general approval. In a number of cases, however, Managers have written to say that they have no suitable woman on their staff to whom they can entrust the formation and organization of a local branch.

Mrs. Eileen Murphy, the B.C.G.A. representative on the Executive Committee of the Women's Gas Council, informs the "JOURNAL" that she is in touch with a number of competent women who would be able to fill such positions admirably, and she will be glad to give a selection of names to any Managers who are interested.

Ten Years' Gas Lighting Contract for South London

The Southwark Borough Council has resolved to enter into a contract for ten years with the South Metropolitan Gas Company for improved lighting in Blackfriars Road. The Company's new "Supervia" lamps will be used, and in view of the width of the road two lamps will be suspended over the carriageway from each span, the spans being 35 yards apart. The length of road to be relighted is 1,100 yards.

Of the 867 miles of road in the South Metropolitan Company's area of South London 687 are now lighted by gas, and on forty-two miles high-pressure lighting is installed. A demonstration of the new "Supervia" lamp has recently been given in Lewisham, and installations have just been completed in Brixton Hill and Wandsworth Road for the Borough of Lambeth.

Eileen Murphy—Author

Lovat Dickson's Summer List contains a book entitled "Our Last Two Thousand Years—an Irishwoman's History of England."

The Gas Industry will be interested to note that the Irishwoman is none other than Eileen Murphy, whom they knew as lecturer, home planning expert, and general gas enthusiast at the B.C.G.A. long before she received her present appointment there as Home Service Director. Her many friends among our readers will be quite ready to believe, as the publishers say, that she has "refused to swallow the judgments of academic historians." In the matter of history, as of other questions, she has made her own investigations and formed her own judgments, and "the result is a flesh-and-blood history of England for the ordinary reader whose recollections of history are rusty or fragmentary."

Pleading guilty, it is with keen anticipation that we shall queue up with the rest of the "ordinaries" for our copy. We understand that publication is this week.

North British Association of Gas Managers

Preliminary Programme of Annual General Meeting

The Annual General Meeting of the North British Association of Gas Managers will be held in the United College Hall, The University, St. Andrews, on Thursday, Sept. 12, 1935.

The usual Annual Excursion will take place on the following day, Friday, Sept. 13, and will take the form of a motor tour *via* Durie Den to Mount Melville, returning to St. Andrews, where Luncheon will be served in the Victoria Café.

The Town Council of the City and Royal Burgh of St. Andrews will accord a civic reception to the members and their lady friends in the Younger Graduation Hall, St. Andrews, on the evening of Thursday, Sept. 12—Reception by Provost Norman Boase, J.P., at 7.45 p.m. The Chairman and Directors of the St. Andrews Gas Company will invite the members and lady friends to a dance immediately following the reception.

To commemorate the Centenary of the St. Andrews Gas Company, the Chairman and Directors will invite members attending and their lady friends to a Luncheon in the Town Hall, St. Andrews, at 1 p.m. on the Thursday.

A Putting Competition on the Putting Greens, Bruce Embankment, St. Andrews, is being arranged for ladies on the Thursday. After the Competition ladies will be entertained at Tea in the Tudor Café.

Golf and Bowling Competitions.

The Golf Competition for the Association Challenge Bowl will take place on Wednesday, Sept. 11, over the Eden Course, St. Andrews. Entries should be made to Mr. J. O. Scott, Hon. Secretary, New Grange Works, Edinburgh, 11, not later than Aug. 24.

By courtesy of the St. Andrews Bowling Club, the Bowling Competition will take place on Wednesday, Sept. 11, on the St. Andrews Bowling Green, Kinnessburn Road, St. Andrews, at 2 p.m. Intending competitors are requested to forward entry, position they usually play, along with the Annual Subscription of 5s. to Mr. Thomas Thomson, Hon. Secretary, c/o Messrs. Gillon, Brown, & Co., Ltd., 68, Gordon Street, Glasgow, C.1, not later than Sept. 9. During the afternoon, ladies attending the meeting will meet at the Bowling Green, where Mrs. Bruce will be "At Home."

A Competition for Ladies will also take place on the Wednesday.

Sheffield Lighting Department

Superiority of Artificial Silk Mantles

The report on the work of the Sheffield Lighting Department for the year ended March 31, 1935, states that from April 1 the lighting of Norton and Dore became the responsibility of the Sheffield Lighting Department. A total number of 419 lamps was taken over. Of this number, 302 are gas and 117 electric. An immediate overhaul of the street lighting plant in the Norton area was necessary. Repairs were carried out on 100 lanterns, and 104 gas clockwork controllers were returned to the makers for overhaul and repair. The Sheffield type of gas burner was fitted to help in the standardization of plant. The gas lamps were fitted with "Mor-lite" reflectors, which has resulted in a considerable improvement in the lighting effect.

The total number of new lamps erected during the year is 792. Of this number, 99 are gas lamps. In some cases, because of demolition of slum property, court lamps have been discontinued, and this has necessitated the erection of street lamps in order to maintain a satisfactory street lighting service in the slum clearance areas.

The total number of gas lamps in use is 15,965 against 15,722 at March 31, 1934. The total gas consumed during the year amounted to 270,368,435 cu.ft. At March 31, the total candle power of the lamps in use was 2,778,477, an increase of 352,735 since March 31, 1934. The candle power per head of population is now 5·35, an increase of 0·61 candle during the year.

There are 15,882 gas lamps mechanically controlled. The efficiency of performance during the year is 99·752%. The 6,299 electric lamps throughout the city are controlled by 292 time switches. The efficiency of performance is 99·901%. The total wages bill for the year is £23,165, of which £1,425 is paid in retiring allowances. During the year 66,841 gas mantles have been used. This is a reduction of 14,967 used during the previous 12 months. The average effective life of the gas mantle during the year was 2,068 burning hours, an increase in life of 273 burning hours over the average of the previous year, and an increase of 468 burning hours over the average life of the mantles consumed during the year ended March 31, 1933. The astonishing durability of the gas mantles reflects creditably on the mantle manufacturers, the careful storage in the Sheffield Lighting Department, and perhaps to an even greater extent on the carefulness of the Sheffield lamp attendants.

In conjunction with a British mantle manufacturer, an interesting test was inaugurated during the year on different grades of mantles:

(1) Ramie mantle.
(2) Combination of cotton and artificial silk.
(3) Another combination of cotton and artificial silk.
(4) Ramie and artificial silk.
(5) Artificial silk.
(6) Artificial silk, but of a different weave.

At the end of the year under review the tests were not completed, but they have gone far enough to prove that the artificial silk mantles are much superior to the others in durability and equal in lighting value.

Athletic and Social

Long-Service Records at Cheltenham.

Tributes to half a century's loyal service in one case and nearly a score of years in the other were paid at the North Street Offices of the Cheltenham and District Gas Company recently, when presentations were made to two retiring members of the office staff.

They were Mr. John Francis Lawson and Mr. Robert Hinkin Keeble, and there was a large number of the staff present at the ceremony, which was performed by Mr. A. L. Morris, Accountant and Sales Manager of the Company.

Mr. Lawson received an oak desk and chair, and Mr. Keeble a lamp standard.

Mr. Lawson joined the office staff at the Gas-Works in 1885. After having served for four years at the Works, he removed to the North Street Offices of the Company, then recently opened. There he held successively the positions of general clerk, collector, chief clerk, and finally, for 13 years, Chief Clerk and Cashier.

Mr. Keeble joined the office staff at the North Street Headquarters during the war, when he was already over service age. He has served as cashier for twenty years.

Swansea Superannuation and Co-Partnership Schemes.

The Annual General Meetings of the Superannuation Scheme and of the Co-Partnership Scheme of the Swansea Gas Light Company were held on Thursday, April 25, 1935.

Mr. Ernest H. Leeder (Chairman of the Company) presided, being supported by Messrs. J. F. Coonan, Hugh Bellingham, and W. H. Ashmole (Directors), Mr. W. H. Johns (Engineer and Manager), Mr. Ernest Ablett (Secretary and Assistant Engineer), and by Members of the Committees of both Schemes.

The report of the Management Committee for the year ended Dec. 31, 1934, states that the scheme now has a fund value of £30,915. Throughout the year superannuation allowances were paid to 32 non-contributing members and to 6 contributing members. Contributions to the extent of £405 were refunded to contributing members and interest to the extent of £43 was allowed in respect of such repayments. The Directors' generous undertaking to reimburse, over a period of ten years, the amount of pensions paid out by the scheme, terminated on Dec. 31, 1933, and accordingly the income for the past year shows a decrease. On Jan. 1, 1935, the income from the investments of the fund was at the rate of approximately £1,546 per annum, while the amount being paid at that date as superannuation allowances from the scheme was at the rate of approximately £1,837 per annum. The Management Committee regret to record the death during the year of Mr. W. Crutchley, who had been a member of the Committee since the inception of the scheme. Mr. W. E. Awbery was elected, at the last Annual General Meeting, to fill the vacancy created.

The report of the Co-Partnership Committee for the year ended Dec. 31, 1934, states that the Company were able, in spite of the continued industrial depression, to make an allocation of Co-Partnership bonus of £250. This amount, together with the balance of fund account brought forward, will enable a distribution to be made at the rate of 1% based on the salaries and wages for the year ended Dec. 31, 1934.

Southminster Gas Company Changes Hands

The Southminster Gas Company, previously the property of Mrs. W. C. Church, has been acquired as from the beginning of the present month by Mr. R. V. E. de B. Crawshay, whose name will be not unfamiliar to readers of the "JOURNAL."

The Southminster Company has an annual output of some 4½ millions, and the new owner, we understand, is already busy with various improvements, including the re-equipping of the disused showrooms. He has also circularized all his consumers assuring them of his personal interest in the business and of his determination to render the same reliable service that they have been accustomed to.

Carnival Display at Colchester

First prize in the Manufacturing and Distributing Section of the local Carnival was awarded to the Colchester Gas Company for the attractive display illustrated in the accompanying photograph.

The general scheme of external decoration and lettered panels was carried out in Jubilee blue and silver, while the fittings of the kitchen included a Main's "Sussex" cooker, "Sunhot" water heater, and gas refrigerator.

One of the chief features of the exhibit was the fact that gas was actually used on the lorry, supplied from a container through a reducing governor. The cooker was in use during the procession for boiling water, while cooking operations were also carried out *en route*. The "Sunhot" boiler was also "alive" and had previously been heated. It was fed from a thirty gallon tank mounted on the top of the framework of the lorry, and by this means hot water was shown issuing from the tap both during the judging and at various points *en route*. Steam was also issuing from a large kettle on the hotplate of the cooker.

The two chefs were loaned by Radiation Ltd., while the two meters with gasholder hats, two cookers with "Regulo" hats, and two geysers were designed and made locally.

The back of the exhibit displayed an "R.A." cooker by the Parkinson Stove Company, as fitted in the King's House, and five-radiant Parkinson "Panno" gas fires. Another feature of the exhibit was that during the procession 1,000 bags overprinted "COOKED BY GAS" and each containing one brandy snap and one shortcake, made by the Company's lady demonstrator, were distributed to the general public.

Western Junior Gas Association

Summer Meeting at Weymouth

The Summer Meeting of the Western Junior Gas Association was enjoyed by about 50 members last Saturday when they were the guests of the Weymouth Gas Company.

In ideal weather the new gas-works at Weymouth, which were opened in July, 1933, were inspected. Members were welcomed by the Vice-Chairman of the Company (Mr. J. R. George). Mr. J. T. Joyce (Engineer and Manager) arranged for parties to inspect the plant. The retort house has six beds, 10 retorts, 24 in. by 16 in. by 23 ft., charged by F.A. stoker, the coke being handled by the Le Fleuve hydraulic conveying and quenching system. Coke handling is done entirely by one man who operates a crane either to the stock heap or screening and grading plant and bunkers. There is the usual washing and scrubbing and purifying plant.

The central control of electrical switchgear, the design of the late Mr. Ranken, is a particularly ingenious device. The dynamos are coupled to gas engines; the cooling tanks for these engines being incorporated in the roof of the power house are invisible.

Following the visit, tea was served at the Trocadero Restaurant through the courtesy of the Chairman and Directors of the Company. Mr. J. H. DYDE (Plymouth), Senior Vice-President, presiding, apologized for the unavoidable absence of the President, Mr. D. L. Copp, and said that the Association was honoured by the presence of Mr. J. R. George and Mr. H. Lambert (Directors), Mr. J. T. Joyce (Engineer and Manager), and Mr. E. Kitchen (Secretary), of the Weymouth Company. He also paid tribute to the excellence of the Works.

Mr. S. B. JONES (Clevedon), Junior Vice-President, supported the motion, which was received with acclamation.

Mr. J. R. GEORGE, replying on behalf of the Company, apologized for the absence of the Chairman, who had found it impossible to be present. He said they had been very pleased to have the Association with them, and hoped it would not be the last time.

Mr. J. T. JOYCE said he appreciated the complimentary remarks about his Works, and explained the reason for various parts of the layout. He said this was the first Association to visit the Works as a body since they were built, though he had numerous individual visitors.

Members then proceeded to the s.s. "Empress" for a tour of H.M. ships in the harbour assembling for the Review. Some 40 ships, including two aircraft carriers, destroyers, and submarines, were seen.

Ammonia and Tar in 1934

Chief Inspectors' Report on Alkali, &c., Works

In our Editorial Columns to-day we refer to some of the findings of the Chief Inspectors of Alkali, &c., Works in their Report for 1934 (H.M. Stationery Office, price 9d. net). The following information is extracted from the report:

TABLE I.—*Ammonia Products Manufactured in England and Wales.*

[Expressed as Sulphate (25¾% NH_3)—Tons.]

From Liquor Produced in –	1934.	1933.	1932.
Gas-works	102,300	89,500	97,800
Other works (including coke ovens, iron works, producer gas, synthetic, &c.)	458,700	557,500	626,700
Total	561,000	647,000	724,500

NOTE.—Of the above total, the equivalent of 83,200 tons was manufactured as concentrated liquor, and 16,800 tons of this concentrated liquor was subsequently converted to salts which are included in the 561,000 tons above. The total quantity of salts of ammonia produced, therefore, was 477,800 tons and the net production of ammonia was 544,200 tons.

TABLE II.—*Tar Treated in England and Wales—Tons.*

Origin.	Tar Distilled.	Pitch Produced.
Gas-works	992,200	243,300
Coke ovens	587,900	216,500
Other works	27,000	9,800
Total	1,607,100	469,600

NOTE.—Of the above total quantity of tar, it is estimated that 883 800 tons were distilled for the production of pitch, the balance of 723,300 tons being treated only for the preparation of road tar, &c.

TABLE III.—*Salts of Ammonia, expressed as Sulphate, Manufactured in Scotland.*

—	1934.	1933.	1932.
	Tons.	Tons.	Tons.
Gas-works	12,269	11,205	11,657
Iron works	295	230	*Nil*
Coke ovens	6,392	3,751	4,085
Producer gas	*Nil*	*Nil*	*Nil*
Shale works	25,240	25,269	25,152
	44,196	40,455	40,894

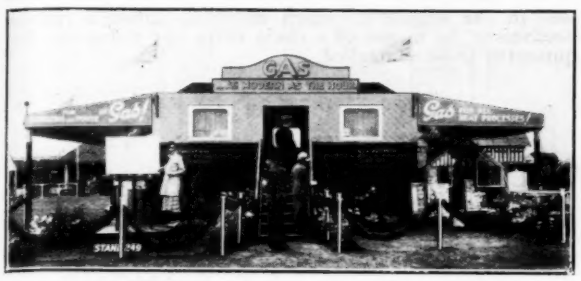
NOTE.—Included in these totals are 919 tons recovered as liquor ammonia, and 78 tons as ammonium chloride.

TABLE IV.—*Tar Made in Scotland.*

—	Tar Distilled. 1934.	Pitch Produced. 1934.	Tar Distilled. 1933.	Tar Distilled. 1932.
	Tons.	Tons.	Tons.	Tons.
Gas-works	134,979	24,644	137,548	131,049
Iron works	3,298	2,685	1,898	*Nil*
Coke ovens	19,985	6,166	13,089	14,277
Producer gas	117	*Nil*	408	186
	158,379	33,495	152,943	145,512

FINE GAS DISPLAY AT THE Royal Agricultural Show

On behalf of the Gas Industry an excellent display was arranged by the Newcastle and Gateshead Gas Company at the Royal Agricultural Show held at Newcastle-upon-Tyne from July 2 to 6.



The Travelling Gas Showroom

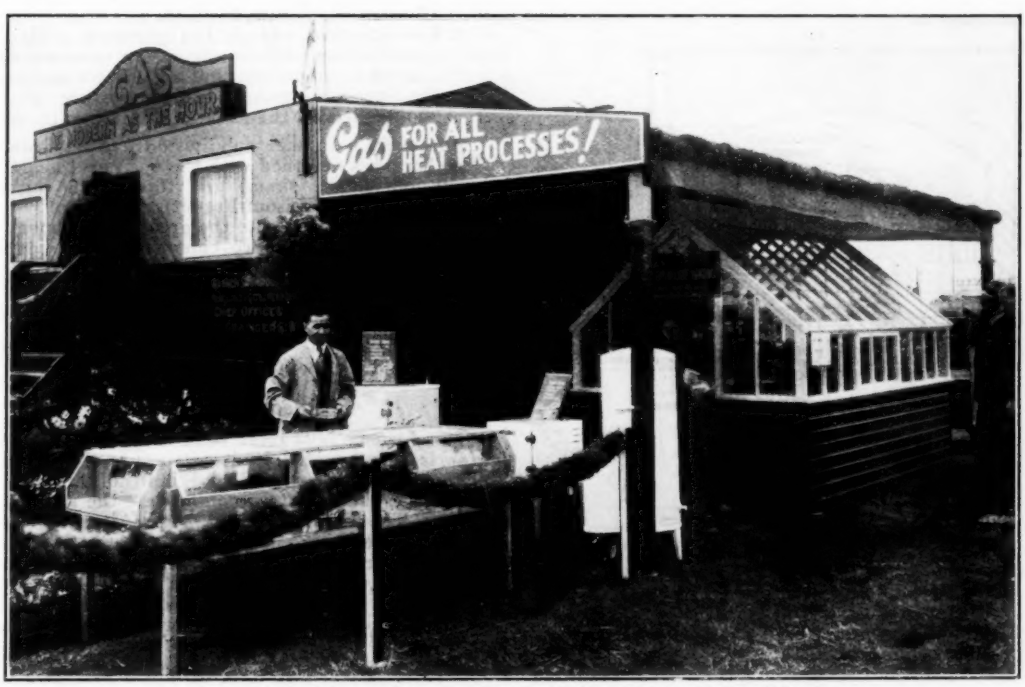
The Company secured a good position in the Main Avenue, covering 1,600 sq.ft. The centre position was given over to the Company's Travelling Gas Showroom to which were fitted coloured awnings at each side 10 ft. in width by 20 ft. in length. The open grass verge at the back and front was occupied by borders and beds of flowering plants and shrubs, and linked up by green raffia festooning for railings, giving the whole an attractive appearance.

On one grass plot outside, a lady artist gave lightning sketches, bringing gas to the notice of the crowds of visitors to the Show. On the adjoining grass plot, gas for poultry rearing was demonstrated by one of the latest gas-heated brooders. Specialized exhibits of the use of gas on the farm and dairy were displayed under the awnings. These included a milk can and milk bottle sterilizer as a complete unit requiring no separate steam generator, a 35-gallon capacity gas-heated steam jacketed milk boiler suitable also for pasteurizing, and a 1½ b.h.p. gas engine suitable for all classes of dairy work, a 2½ b.h.p. gas engine for work on the farm, such as hay chopping, corn crushing, pumping sets, &c. A greenhouse arranged with flowering plants demonstrated a gas boiler for greenhouse heating.

A comprehensive exhibit of gas labour-saving appliances for cooking, heating, refrigeration, water heating, and laundry work was displayed inside the Travelling Showroom. The whole range of appliances were demonstrated in actual operation.

The weather was ideal for the Show, and visitors interested in refrigeration were served with ices. Gas was chosen for cooking, as well as for the provision of hot water at the Royal Pavilion and for all the large cafés catering for the host of visitors to the Show.

Some 15,000 ft. of gas piping was laid by the Newcastle Company to provide for the cooking, lighting, and water heating, and to provide a gas supply for various purposes at stands of Exhibitors throughout the Show grounds. Over 120 cookers and a large number of gas boilers and water heaters were installed to meet these requirements. The advertising value of the Company's efforts in this respect were taken full advantage of in the local newspapers as topical news during the period of the Royal Show.



Another View of the Newcastle Company's Display at the Royal Show

Automatic Control

The Hopkinson-Carlstedt Regulator

As recently announced Hopkinsons, Ltd., have completed arrangements for the manufacture and sale in this country of a regulator developed by a Swedish engineer who has been responsible for the development of many automatic regulating devices.

Previous regulators of the hydraulic type, while proving very satisfactory, are claimed to be surpassed by the latest electric type which has shown itself to be very much more sensitive and responsive to changes in conditions. The regulators are used in conjunction with various types of valves and other control apparatus to maintain constant conditions in many different industries, such as controlling the consistency of pulp in paper mills, controlling the water supply of steam desuperheaters, temperature control, operating reducing valves for steam, gas, &c., and numerous other operations.

The manufacturers state that the sensitiveness of this type of the Hopkinson-Carlstedt regulator is so great and

the response so rapid that there is no over-running of the apparatus, an advantage which is of great importance in many installations. In cases where there is considerable lag between the altering of the conditions and the final results as occurs in some operations, a device is introduced which only allows the regulator to operate a small amount for each altered condition. One of the main features of this regulator is its extreme simplicity in comparison with other types which require water or air for their operation. Only a supply of either A.C. or D.C. electricity is required for the operation of the special type of reversible motor used in the regulator, which operates, through suitable mechanism, by means of a chain drive any valve or other apparatus to be controlled.

The Technique of Cremation

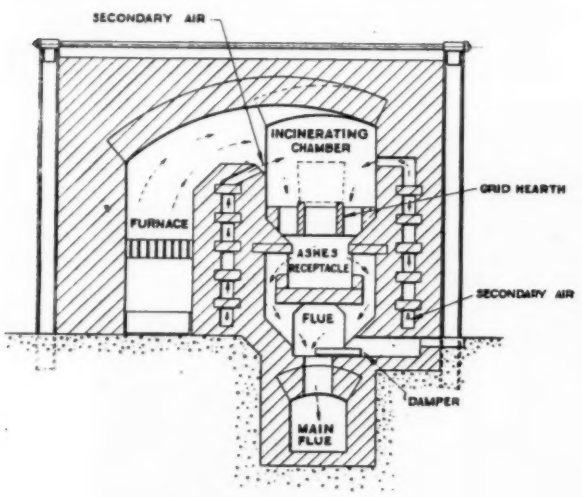
This Paper was presented by Mr. G. le B. Diamond (Engineer and General Manager of the Folkestone Gas and Coke Company) and Mr. T. V. Garrud (Special Service Section of the Gas Light and Coke Company) at the Fourth Joint Conference of the Federation of Cremation Authorities in Great Britain and the National Association of Cemetery and Crematorium Superintendents, which was held at Folkestone from July 1 to 4.

by
G. LE B. DIAMOND
and
T. V. GARRUD

Following an account of several of the earlier types of coke-fired cremating furnaces, the Authors passed on to describe the Gibbons furnace.

The firm of Gibbons Bros. have acquired over a long term of years a considerable reputation as designers and builders of high-temperature carbonizing plant and furnaces of all descriptions. In their semi-gaseous reverberatory cremating furnace they make full use of the experience they have attained in the fields of industrial activity.

As will be seen from fig. 1, the furnace proper is situated at the side of the incinerating chamber. Some pre-heating of the secondary air is brought about by taking the air ports up through the hot brickwork forming the main structure. An open grid refractory hearth is provided and a pilot fire is recommended at the base of the stack.



CROSS SECTION
GIBBON'S CREMATING FURNACE

Fig. 1.

Although the use of coke for cremation purposes has declined in popularity on account of the great improvement which has taken place in the modern gas furnace—resulting in low capital charges, great flexibility, low cost for fuel—it should not be overlooked that coke is a most convenient medium for use in outlying country districts where there is no gas supply.

Among the many advantages which can be claimed for coke furnaces are the following: Entire absence of odour; no fans or blowers required; low fuel cost; uses a British smokeless fuel; speed of operaton; incineration effected in a separate chamber without contact of fuel; very low maintenance costs.

Gas-fired Cremation Furnaces.

Gaseous fuel possesses the characteristics of being infinitely flexible and capable of absolute control. Moreover, in the form of town gas it is a fuel of guaranteed purity and known calorific value, to which desirable qualities can be added the following: Never fails; ready at all times for immediate use; no waste; no storage required; minimum labour cost; any temperature obtainable; combustion can be localized if desired; oxidizing atmosphere obtainable at will; clean and pure heat.

It is not surprising that, with so many advantages, gas has acquired an almost universal use in the crematorium. In the British Isles alone no fewer than 21 of the 29 crematoria are equipped with gas-fired furnaces, while of the remainder six are coke-fired, one coal, and one oil.

Gas-fired cremation furnaces used in this country can be divided into the following types:

1. Those using low-pressure gas and air combusted by bunsen burners at atmospheric pressure (Askam, Lockwood, Toisoul-Fradet).
2. Low-pressure gas at fan pressure utilizing surface combustion with auxiliary fan pressure air (Cox's Ignite Combustion, Radiant Heat Company, Ltd.).
3. High-pressure gas and high-pressure air separately controlled on the same nozzle (Rogutt, Askam).

Moreover, a further subdivision can be drawn between those furnaces designed with the open grid hearth (Rogutt, Lockwood, Cox, Askam) and those with the closed flat hearth (Askam, Toisoul-Fradet).

It is interesting to note the great development which has taken place and the improvement in the application of heat and air as experience has been acquired.

In the years 1904 and 1905 the French firm of Toisoul-Fradet et Cie. erected gas-fired cremating furnaces at Leeds and Bradford.

The following is a general description of this type of furnace and its operation:

Toisoul-Fradet Furnace.

This furnace is of more than usual interest as a recuperator is incorporated in its structure. The incinerating chamber is vault-shaped and built of firebrick with two grooves in the floor to accommodate the arms of the introducer. The bunsen gas burners are situated at the far end of the incinerating chamber opposite to the door. At the two sides are the pipes which bring the hot air from the recuperator, each provided with a valve for regulating the supply. At the sides near the door are situated the flues for conducting the incineration vapours and gases to the smoke tubes of the recuperator.

The introducing door is in two parts and consists of folding doors of cast iron with an inner door also of cast iron containing the framework to hold firebrick blocks.

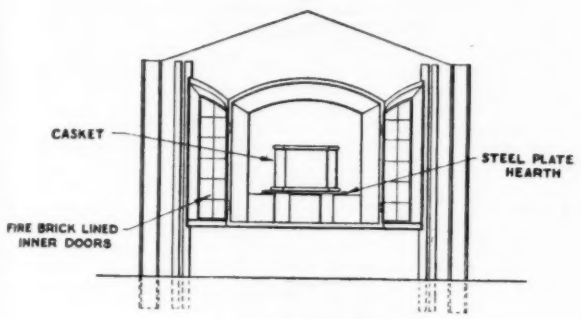
The incinerating chamber is 8 ft. 8 in. long by 2 ft. 10 in. wide by 2 ft. 5 in. high, thus giving ample room for a large-sized coffin.

The recuperator is constructed below the incinerating chamber and consists of a system of tubes and flues for the purpose of pre-heating the cold air before its admission to the Chamber. The highly oxidizing atmosphere thus produced accelerates the whole operation of reducing the body to white ash.

A number of dampers are provided to enable the heat of the chamber to be regulated. The gas bunsen burners consist of three sections of 6 burners, each mounted on a float rail and each burner is separately controlled.

At the base of the chimney is fixed a gas pilot for the pur-

pose of creating a draught if necessary. In fig. 2 is shown a general arrangement of this type of furnace.



FRONT ELEVATION
TOISOUL FRADET (PARIS)
CREMATORIUM FURNACE.

Fig. 2.

The Superintendent of the Bradford Crematorium states:

"With over 20 years' experience of this type of furnace I consider that it can claim to possess the following advantages:

"The furnace has a long life with few repairs or renewals and the wear and tear is reduced to a minimum; there is no trouble with fuel, which is always ready when wanted. Gas is cheap and clean and useful for intermittent incinerations; or it can be used continuously; it is ready for another operation as soon as the ashes are removed, and used in this manner a saving of gas is effected; no particular skill is required in working and regulating it. The furnace has been a good investment; it has been in use 30 years and cost in repairs less than £1 per year."

The Lockwood Furnace.

A similar type of furnace was also erected at West Norwood in 1915, but without the recuperator, and in 1916 Mr. Arthur Lockwood, the Secretary of the South Metropolitan Cemetery Company at West Norwood set to work to design a furnace on entirely new lines, which no doubt was prompted by his experience with the French furnace coupled with a progressive and inventive turn of mind.

Mr. Lockwood reversed the burner and draughting arrangements of the Toisoul-Fradet, and introduced burners at the front. This was an improvement on the earlier furnace, as this would overcome any unpleasant effects of drawing the products of combustion towards the door. Moreover, Mr. Lockwood introduced some pre-heating to the secondary air and designed and patented the first iron open grid hearth used on a gas furnace.

In order to accelerate the heating of the furnace and the incineration of the human remains, Mr. Lockwood devised a swinging baffle plate which is suspended from the crown of the furnace and is raised by coming into contact with the coffin when it is introduced, gradually falling as the remains are incinerated.

No further development occurred until Askam, a furnace maker of wide and long experience, produced a low-pressure gas furnace on orthodox gas furnace lines in 1922. In the first Askam furnace the bunsen burners were situated below the incinerating chamber in a combustion chamber, separated from the same by means of an open grid hearth of heavy firebrick construction; there was also some pre-heating of the secondary air.

In 1928 the Cox system of surface combustion was introduced into a furnace supplied to the Bristol General Cemetery Company by the Metropolitan Fuel Company and marked a considerable departure from any previous cremation furnace design. In this case also the hearth was of the open grid type and of iron construction.

The Rogutt Furnace.

In 1932 a further development occurred which is of exceptional interest in consequence of the manner in which it was brought about and the ingenuity displayed by the designers.

The Superintendent of the Bristol General Cemetery Company, Mr. E. Utting, and the Crematorium Attendant, Mr. G. Rogers, without previous training of a type which would fit them for the work they were to undertake, set about the task of designing a furnace on new lines. Moreover, they not only designed, but built with their own hands the furnace, the engine room, and the by no means inconsiderable chimney stack. This furnace, which is known as the "Rogutt," although designed on purely empirical lines, would do credit to any professional furnace designer. The burners are of the pressure gas, pressure air type, with control of either gas or air, and are situated in the crown and sole of the furnace, thus obviating any likelihood of masking the inner cone of flame and causing incomplete combustion.

This furnace is also equipped with an open grid type of hearth of iron construction and is provided with an unusual and highly successful draughting arrangement.

Housed in a separate building, not communicating with the main block, are the pressure raising fans for the gas and air. The noise problem has been overcome in a perfectly sound and scientific way, by hermetically sealing the building and drawing the air supply through a 4 in. tube communicating with the furnace room. This effectually damps out the vibrating column of air which is set up by the beat of a fan.

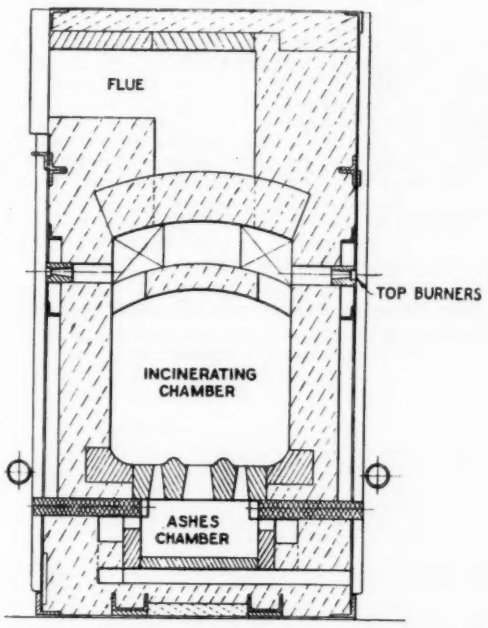
This furnace is claimed to have the following advantages:

1. The cost of construction is low.
2. The gas consumption is very moderate, averaging 1,250 cu.ft. per case.
3. Complete incineration is carried out in a much shorter space of time, the average being 1 hour 10 minutes.
4. The cost of maintenance is low.

Askam Natural Draught Furnace.

Concurrent with these developments Askam has continued to improve the low pressure natural draught furnace, and it is this type which has been installed in the majority of crematoria in this country. It has many excellent points in its favour.

This furnace consists of an incinerating chamber size 8 ft. by 2 ft. 8 in. wide by 2 ft. 6 in. high constructed of firebrick contained in a strong cast-iron and steel frame held together by means of buckstays and tie-rods. The low-pressure bunsen burners are fixed along each side and project the flame to a combustion chamber situated below the incinerating chamber and separated from it by means of an open grid hearth of heavy firebrick construction. A cross section is shown in fig. 3.

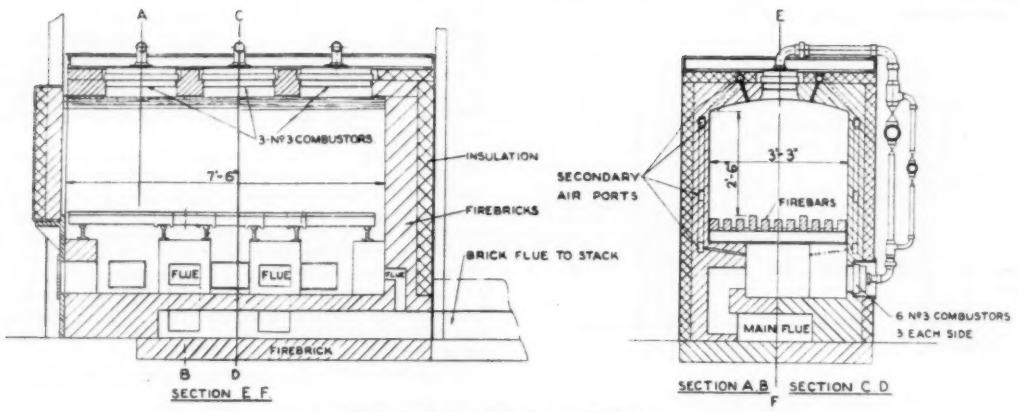


CROSS SECTION
ASKAM NATURAL DRAUGHT FURNACE.

Fig. 3.

The products of combustion pass upwards into the space between the two arched roofs and thence to the chimney. It is exceedingly simple to operate, the low-pressure burners can be lighted by an unskilled person. Indeed a gardener is often employed for the purpose. The furnace can be left running without attention both before and after the introduction of the coffin. There is no machinery to attend to and this obviates the possibility of breakdown. Moreover it is silent in operation and the maintenance costs are very low.

This particular design was first installed at Sheffield



RADIANT HEAT CREMATING FURNACE

Fig. 4.

about 12 years ago, and was constructed in collaboration with Mr. C. Cook, the Superintendent at the Sheffield Crematorium, and Mr. Rennison, of the Sheffield Gas Company. Since that time these furnaces with a number of improvements have been installed at Manchester, Edinburgh, Liverpool, Newcastle, Ipswich, Southampton, Plymouth, Hull, Reading, Stockport, Darlington, and Birkenhead.

The fuel consumption with this furnace is moderate and in one case where over 400 cremations were carried out in a year the consumption averaged 1,500 cu.ft. per case.

Figures lower and higher are attained with this furnace in different parts of the country, but of course the consumption will vary considerably as between one cremation and another, for example, where there are three or four cremations per day the consumption of gas will be remarkably low and likewise where there are long intervals of time between the cases, gas will be required to heat the furnace before use, thus increasing the average consumption per cremation.

Through the courtesy of Mr. Piggott the authors are able to give some figures obtained at Manchester for a series of cremations with the Askam furnace which show a remarkably low gas consumption, and at the same time give a record of the temperature conditions prevailing in the incinerating chamber. The authors desire to point out that these figures are given as a matter of practical interest only and they are particularly anxious that they should not be used for adverse criticism of any furnace or operator. What can be accomplished in one place cannot necessarily be obtained in another unless the fundamental conditions are precisely the same.

The Manchester Crematorium: Consumption of Gas.

Table of Temperatures showing Comparison of First and Subsequent Cremations the same Day.

ASKAM GAS FURNACE "A."

Furnace.	Order.	Introduced.	Time Taken.	Temperature °C.			Gas Consumed.
				Start.	During.	Finish.	
A	1st	11·30	1·30	0	700	520	1,600
A	2nd	1·10	1·40	460	720	600	400
A	3rd	3·0	1·20	550	700	500	*Nil*
A	1st	1·0	2·0	120	710	580	2,000
A	2nd	3·10	1·50	550	700	500	*Nil*
A	1st	11·15	2·0	170	800	600	1,400
A	2nd	1·25	1·45	550	900	720	*Nil*
A	3rd	3·20	1·40	650	850	600	300
A	1st	1·0	1·45	80	720	600	1,500
A	2nd	2·55	1·55	550	800	600	*Nil*
A	1st	11·15	1·15	110	710	580	1,300
A	2nd	12·40	1·40	550	750	600	*Nil*
A	3rd	2·30	1·45	560	800	620	*Nil*
A	4th	4·25	1·35	580	880	650	*Nil*

The Radiant Heat Furnace.

This furnace which has been greatly improved as a result of experience makes use of the system known as Cox Surface Combustion, an arrangement by means of which a mixture of town gas and air is passed through a porous refractory slab. The mixture when ignited causes the surface of the slab to become incandescent, thereby giving off radiant heat of a very penetrating nature.

The furnace is constructed in the usual way with an incinerating chamber separated from an ashes receptacle and combustion chamber by means of an open grid hearth of iron construction. In the latest type of furnace the combustor units are built into the crown of the arch, and in this position are not likely to suffer damage. Moreover, the combustor units in the combustion chamber are set back in the sides in such a manner that they are not prone to become impregnated with zinc, should a zinc-lined coffin be introduced. In fig. 4 a typical example is shown.

Unlike the low-pressure gas furnace this type requires fans for raising the air and gas pressure, but if housed in a separate building and due regard is paid to the scientific principles, no nuisance from noise should be experienced. Secondary air is provided to assist the cremation by means of a highly oxidizing atmosphere.

All smoke and fumes pass to the lower chamber where they are destroyed by the bottom combustors and only clean products are passed by means of suitably arranged flues, to the outer atmosphere.

This furnace is claimed to possess the following advantages:

1. The coffin is introduced into the furnace while the upper chamber is still cold.
2. No chimney is required.
3. The products of combustion pass through the heated lower chamber before dispersal to the atmosphere.
4. The average time per cremation is stated to be 1¼ hours.
5. The gas consumption specified is 1,500 cu.ft. per hour.
6. The radiant combustor units in this furnace are, when working, of beautiful and impressive appearance, which is definitely an æsthetic advantage.

Golders Green Furnace.

Owing to the increase in the number of cremations taking place at Golders Green the Directors of the London Cremation Company were confronted with the need for increasing the facilities available. Their investigations naturally led them carefully to consider from every aspect the available heat-giving medium and make of furnace. In consequence of this investigation they decided in June, 1933, to install a gas-heated furnace to decide for themselves the advantages of gas for their purpose. Moreover, owing to the large number of cremations carried out in one day, and the limited space available, careful consideration had to be given to determine the final design to enable seven or eight furnaces to be fitted in approximately the same space as the then existing coke-heated plant.

At this stage the manufacturer of the trial furnace was decided upon, and it was then a question of whether the now well-known type which operates entirely on the pressure of gas supplied direct from the mains with bunsen burners should be used; or whether to employ a new design incorporating an arrangement for the supply of air under pressure from fans, thus obtaining the higher temperature intensity in the chamber which it was anticipated would reduce the time required for complete disposal.

The latter type was decided upon, but at this period it was not fully appreciated how important this decision was to become, both from the standpoint of economy and as a

means substantially to improve the method of disposal from the æsthetic point of view.

Research showed that air under pressure from a fan or fans appreciably hastened the complete disposal of the body; it was also possible in a short time to dispense entirely with the gas flame and allow for combustion to proceed naturally with the requisite amount of air to support it. With these new gas-heated furnaces it is now possible to raise the temperature to the ignition point before committal and then continue with air alone.

A further six incinerators were installed in 1934 and 1935 by Askam embodying the modifications and designs suggested by Mr. H. T. Herring, O.B.E., M.B., B.S., Managing Director of the London Cremation Company.

These incinerators are provided with a series of gas burners at each side which utilize air under a slight fan pressure. They have been specially designed to be silent in combustion and cannot be heard in the Chapel. A new type of fan is also used which is silent in operation. The burners are of the automatic mixing type and are each provided with regulating dials for easy manipulation. Moreover, the hearth is unusual in that it departs from the hitherto almost universal open grid hearth, and is flat with two steel runners built in.

Exceedingly good figures for gas and air consumption have been obtained and the following particulars are appended by courtesy of the Managing Director of the London Cremation Company, who writes as follows:

The first trial, in November, 1933, consisting of 22 cremations, gave these results:

Time: 1 hr. 37 min. *Gas Consumption:* 3,379 cu.ft.

During the next month or so further minor furnace improvements were effected, but it was not until March, 1934, that intermittent gas supply was tried—*i.e.*, the gas, which up to this date was always alight throughout, was turned off entirely when the furnace was hot, and when the process of incineration continued rapidly under air draught alone. The test of 10 cremations under these conditions gave the following results:

Time: 1 hr. 28 min. *Gas Consumption:* 1,459 cu.ft.

On these figures the Directors decided to install gas furnaces of similar type in the place of the coke fed furnaces previously in use.

By the beginning of the present year, 1935, the whole of the furnace room had been reconstructed and equipped with gas furnaces, and the following statistics based on 801 cremations carried out during the past fourteen weeks indicate approximately what has been achieved:

Average time	1 hr. 25 mins.
,, gas consumption	1,000 cu.ft.
,, weight of body	10½ stone

It may be said also that the tendency is for both time and gas consumption to fall as the operator gets accustomed to the working.

Askam's Latest Furnace.

Since the furnaces at Golders Green were installed a new pattern has now been designed by Askam which contains several interesting features. In the first instance the secondary air for the incinerating chamber is heated by means of the products passing to the flue.

Low-pressure gas burners are also placed in the ashes chamber supplying indirect heat, a most convenient arrangement in the event of the electric supply being interrupted, and the fan being stopped, for in such circumstances a cremation can be completed without trouble. It should be pointed out, however, that the low-pressure burners are in addition to the pressure type used with the fan.

The new furnace has been increased in size and considerable attention given to insulation, additional insulating refractories being added to prevent loss of heat by radiation.

Chapel Heating.

This Paper would not be complete without some reference to chapel heating, because it is a matter which must arise wherever crematoria are established or contemplated.

At Golders Green, before the change over to gas-heated furnaces was made, the chapels were warmed by the familiar Grundy "Hestia" air heaters, which were coke-fired. These have now been successfully converted to gas heating and are giving satisfactory results.

The chapels can be maintained at any required temperature by means of relay thermostats, and the heaters are entirely automatic and trouble-free. Similar systems are readily convertible to gas heating, and an installation in a Rotherham church using plant made by the British Pipeless Central Heating Company, has also had gas applied to it.

Another system has recently been perfected, and where a heater and ducting are not installed or contemplated, is to be recommended. The system makes use of Cox combustors made to special shapes by the manufacturers, Radiant Heating, Ltd., and it has the special advantage that in chapels used intermittently comfortable conditions are very speedily attained. The combustors are suitably housed and used as wall heaters fitted at heights not less than 10 ft. from the ground and inclined downwards at an angle of approximately 45°.

A mission hall in London is fitted with this system of heating, and adequate and comforting heat is provided if the combustors are lighted half-an-hour before the service commences. The method has the following advantages: Low installation cost; rapid attainment of comfort; low running cost; pleasant heating with low air temperature; neat appearance; no floor space occupied.

Conclusion.

It is obvious that the furnace required for a country crematorium with a comparatively few cremations per annum will differ considerably from the furnace required in a large city, where there may be a large number of cases in succession. The former will be amply provided for by the natural draught low-pressure gas furnace, while the latter may require a furnace making use of air under pressure for obtaining the higher temperature intensity required.

The following additional points might serve to assist members in their selections:

1. The process being essentially one of combustion, enquiry might be directed to the capability of the furnace of fulfilling completely this primary condition.
2. For the good name of the Movement it is vital that the æsthetic side should receive careful thought.
3. Reliability is of supreme importance.
4. Maintenance and operating costs must not be neglected.
5. The furnace should be capable of being operated by the labour which is normally available in a crematorium.

Parliamentary Intelligence

South Suburban Gas Bill

The Unopposed Committee of the House of Commons on Thursday, July 4, dealt with the South Suburban Gas Company's Bill, which has already passed the House of Lords.

The Bill has been promoted as the result of a requirement in the Company's Act of 1928 that the Company should promote a Bill this Session to give an opportunity for the revision of the basic price. No objection, however, has been taken to the basic price as already fixed, and apart from giving this opportunity to local authorities concerned the Bill contains a number of miscellaneous provisions. The limits of supply are re-defined in accordance with the review of local government areas under the Local Government Act of 1929. Powers are also taken to raise additional capital to the extent of £500,000 and to increase the borrowing powers on the new and existing capital to 70%. It was mentioned to the Committee that the Company is spending on capital account nearly £200,000 per annum for the purposes of extensions to plant, mains, &c. The Bill also authorizes certain alterations in the existing powers of the Company to enable a superannuation scheme now in hand to be put into force and with which the existing powers do not quite fit. Since the Bill was before the House of Lords, a clause has been agreed with the Kent County Council giving protection as regards highways in the county.

The Bill was ordered to be reported for third reading.

The President and some of the Members at the Cleckheaton Works.

Manchester District Association of Gas Engineers

On Friday, July 5, members of the Manchester District Association of Gas Engineers visited the Gas-Works at Cleckheaton, which is under the control of their President, Mr. A. L. Jennings

The size of the gathering which assembled for the visit last Friday to the home town of the President was both a tribute to the popularity of Mr. Arthur L. Jennings, and an indication that an interesting day was anticipated. This expectation was fulfilled in every way, and the splendid support which was accorded to Mr. Jennings by the Spenborough Urban District Council during the day, and the excellence of the entertainment they provided, showed that they esteem their Gas Engineer and Manager just as highly as the Manchester District Association esteem him as President.

Cleckheaton Gas-Works.

Admirable arrangements having been made by the Hon. Secretary, Mr. J. Bridge, to convey members to Cleckheaton, an inspection of Mr. Jennings' Works was in full swing at 11.45. Well laid-out, clean, and "comfortable" were the prevailing general impressions, while efficiency everywhere was confirmed by closer enquiry into details.

The carbonizing plant consists of four settings of Woodall-Duckham vertical retorts, which, according to the latest figures, give a yield of 89·89 therms or 19,526 cu.ft. of 460 B.Th.U. gas per ton of coal carbonized, which includes a correction for benzole extraction of 683 cu.ft. per ton. A Drakes screening plant of 20 tons per hour capacity deals with the coke, which is graded and passed into four bunkers for the various sizes, giving a total storage of 100 tons.

A feature of the coke treatment is a plant for the recovery and washing of coke from the retort furnace pan ash. The capacity is 5 tons of ash per hour, and coke recovery is 36%. The fine ashes are readily sold, and the plant also produces smith's breeze which sells at 5s. 10d. a ton above the price obtained for the ordinary grade of coke.

The exhausters comprise one set of 80,000 cu.ft. and one of 50,000 cu.ft. per hour capacity. The washing plant consists of a Livesey washer for tar extraction, a Holmes washer-scrubber, and a Clapham's washer recently brought from the Heckmondwike Works. The water tube condensers are of Clapham's make. There are six purifier boxes 30 ft. by 25 ft. by 5 ft. deep, two being used as catch boxes. The purifier boxes are emptied by means of a portable elevator.

Operating on the outlet main from the purifiers is the benzole plant, which was erected in 1933, and gives an output of 2·37 gallons of benzole (77% at 120° C.) per ton of coal carbonized.

The station meter has a capacity of 40,000 cu.ft. per hour, and adjacent to this is the governor plant and photometer house. Compressing plant by George Waller & Son, Ltd., is used to supply gas to distant holder stations. There is also a booster for augmenting the district pressure when the Cleckheaton holder (of ½ million cu.ft. capacity) is working in the first lift. The maximum daily output of the Works is 1,482,000 cu.ft.

Guests of the Urban District Council.

Motor omnibuses conveyed the members to Cleckheaton Town Hall where they were guests, at luncheon, of the Spenborough Urban District Council, whose delightfully genuine welcome found expression in a very happy function.

Councillor E. Saxton (Chairman of the Spenborough Gas Committee) proposed the toast of "The Manchester District Association of Gas Engineers." He was a firm believer in such associations and held that the time and energy devoted to them could do nothing but good. In view of the fact that the list of Presidents of the Association had included the names of the gas engineers of large cities, he considered it a great honour that their present President was the Spenborough Engineer and that they were visiting the comparatively small district of Spenborough. He believed, however, that in regard to most things the Spenborough Undertaking was quite up to date. As to the Association itself, there could be no doubt that if it was required in 1870 it was certainly ten times more needed to-day.

The toast was responded to by Mr. Arthur L. Jennings, who commented on the great progress made by the Gas Industry in modern times. Twenty-five years ago, he said, a well-managed gas undertaking, with up-to-date installation, would obtain about 65 therms per ton of coal, whereas the figure to-day was in the region of 90 therms, with a corresponding increase in the production of that all-important residual, tar. This change had been brought about by the improvements in carbonizing systems and practice and the invention and manufacture of highly refractory materials allowing of higher temperatures being worked in the retort installations. In addition there had been improved stoking machinery in the case of horizontal retorts and many other developments too numerous to mention. The gas engineers did not take all the credit to themselves for these improvements in the processes of gas manufacture. The progress made was largely due to the enterprise and skill of directors of engineering concerns which specialized in the manufacture of plant for gas undertakings and to whom he wished to express the thanks of the gas engineers for the services that they rendered. They did not confine their thanks to those firms, but

Chairman and Vice-Chairman of the S.B.G.I., Messrs. D. M. Henshaw and F. B. Richards, M.B.E., at the Works.

extended it also to people who specialized in the making of appliances for domestic and industrial use, whose continuous improvement in design and efficiency allowed the Gas Industry to maintain the prestige which it had always held in the industrial field. The Gas Industry appreciated to the full the fact that it made the greatest contribution in the world to the important problem of smoke abatement.

If they were to have the opportunity of extending the cause of smoke abatement, it was necessary that it should be enabled to do so by selling gas on more favourable terms in the future than they could do in the past. If there was one direction in which their electrical friends had excelled the Gas Industry, it was in their method of charge. Gas engineers were completely alive to the fact that while the principle of selling gas on a flat rate, or a rate which showed very small differences in prices, might have been satisfactory in years gone by, the public demand to-day was for the sale of gas on more attractive terms.

Restrictive Legislation.

The Industry had asked Parliament in recent years to relieve it of antiquated and restrictive legislation and to allow it to sell its commodity with the same freedom as that enjoyed by its competitors, but for some reason which was hard to explain that privilege or right was still denied to them. So long as that position was maintained the Industry would be unable to make its full contribution to smoke abatement, and a large number of gas consumers would continue to pay more for their gas than they need do. In order to extend the use of gas for industrial purposes, it would be necessary to make it possible to sell gas at more reasonable rates than those which had obtained in the past. All gas undertakings in this country were now linked together for the interchange of information concerning the use of gas for all industrial purposes, and industrialists also had the benefit of the experience of the research departments maintained by the larger gas undertakings. It was to be hoped that industrialists would take full advantage of the means of furthering the use of gas and in that way contribute to the attainment of the larger success for which the people in the gas industries hoped.

Mr. A. L. Holton (Chief Engineer of the Manchester Gas Department) proposed the toast of "The Spenborough Urban District Council and the Trade of Spenborough." After complimentary reference to the foresight that had led to the amalgamation of several areas in 1915, and alluding to the high efficiency of the Spenborough Gas Undertaking, he spoke of the competition between electricity and gas departments, which he said he hoped would always be friendly though it was keen.

Councillor Geo. Blackburn, J.P. (Chairman of the Spenborough Council), responded to the toast, and Councillor P. N. Hartley (Vice-Chairman of the Spenborough Council) having proposed the toast of "The Visitors," Major W. C. Fenton, M.C., J.P., responded in his capacity as Chairman of the Spen Valley Chamber of Commerce.

An Interesting Factory Visit.

After luncheon, members adjourned to the Moorland Mills of Messrs. Samuel Law & Sons where, at the invitation of Lieut.-Colonel Sir Alfred L. Mowat, Bart., D.S.O., M.C., J.P., they were able to inspect extremely interesting processes connected with the manufacture of card clothing.

A most enjoyable day was concluded with afternoon tea which was provided at the Town Hall.

Gas Undertakings' Results

Birmingham.

The report of the Birmingham Gas Department shows that the quantity of gas sold during the year was a record in the history of the Undertaking, the total sales being 14,444 million cu.ft., an increase of 266 million, or 1·88%, compared with the preceding year, and 128½ million over the previous record year (1930). This result is particularly satisfactory in view of the very mild winter. The amount received from the sale of gas, £1,754,401, shows a reduction of £990, notwithstanding the increased sales. This is explained by the fact that the prices charged during the first quarter of the year were 2d. per 1,000 cu.ft. below the prices operating in the corresponding quarter of the previous year, the reduction representing a sum of £26,250. The amount received from the sale of residuals is slightly below the figure of the preceding year, although larger quantities of coke and tar were sold. The total credits on revenue account amount to £2,254,796, a decrease of £1,359. During the year 852,436 tons of coal were carbonized, compared with 823,710 tons in the previous year. The total charges against revenue account amount to £1,919,770, an increase of £44,983. The credit balance on revenue account amounts to £335,026. The outstanding liability in respect of capital at March 31 last was £2,976,378, against £3,134,225 a year ago. Permanent showrooms are being opened at Darlaston, and a new branch showroom and depot at Northfield. The loan of £125,000 for cast-iron mains and services sanctioned in March, 1932, will have been expended before March 31, 1936, and it is recommended that application be made for sanction to borrow another £125,000 for mains and services. Of the total of 14,444 million cu.ft. of gas sold during the year an aggregate of 4,422,762,000 cu.ft., or 30·62%, of the whole was used in factories in Birmingham.

Blackburn.

The annual report on the work carried out in the Blackburn Gas Department during the financial year ended March 31, 1935, states that the total quantity of gas made has been 1,047,760,000 cu.ft., being a decrease of 19,319,000 cu.ft., or 1·82% under last year. The total wages for the year amounted to £43,182, equal to 10·76 pence per 1,000 cu.ft. of gas sold, as against 10·42 pence the previous twelve months. The total value of appliance sales passed through the showrooms amounted to £23,877, an average of £480 per week, as against £360 per week the previous year, which represents over 7,000 appliance fixings, of which 4,370 were modern switch-lighting pendants, whereby an extra number of employees have been engaged. Cookery lectures at various periods, together with displays at exhibitions have been most popular; consumers have availed themselves of the opportunity of observing and obtaining the advantage of more modern gas appliances. Appliances sold during the year are as follows: 1,329 cookers, 227 fires and radiators, 790 water heaters, and 216 grillers, &c. With the continued development of building sites, it has been necessary to proceed with main-laying and service installations in accordance with requirements. Extensions to mains have been laid to the extent of 6,069 yd., and enlarging and renewing 407 yd. 512 new services were connected during the year. Coal carbonized amounted to 48,848, as against 48,916 tons, a decrease of 68 tons, and 19 million cu.ft. of gas made. Receipts from residuals, after deduction of working expenses, have declined considerably, which is almost wholly due to tar and oils having fallen in value, by reason of severe competition and small demand for exportation. The amount of coke sold locally has been exceptionally good, and the return from the disposal of concentrated liquor, spent oxide, and benzole gives no cause for complaint. The total expenditure in revenue account was £119,709, as against £125,233, a reduction of £5,524, while the income amounted to £184,066, as against £192,092, a difference of £8,026 less than the previous year, with a gross profit of £64,356, as against £66,858, a decrease of £2,502. After payment of sinking fund and interest charges amounting to £57,982, together with an income-tax charge of £8,995, there remains a net profit of £3,234 carried forward for reduction of the amount outstanding, which balance is now £3,679.

Buckhaven and Leven.

A series of fresh records in the history of the Buckhaven and Leven Gas Undertaking was revealed when the annual statistical report was laid before the Buckhaven and Leven Gas Commissioners on June 10. The General Manager, Mr. H. A. Aitken, said that the statistics of the year ended at May 15 last not only showed a continuance of the progressive improvement of previous years, but constituted a series of fresh records in the history of the Undertaking. The quantity of gas made during the past year reached a total of over 141 million cu.ft., while the quantity of gas sold was nearly 9 million cu.ft. in excess of that sold during the preceding year, not only a fresh high record output, but also the maximum annual increase in sales recorded by the undertaking. In other ways, too, progress has been made. The amount of gas unaccounted-for fell to 4½ million cu.ft. for the year, equivalent to only 3·32% of the total. This is an exceptionally low figure for an industrial area, and breaks all previous records. The lowest percentage ever recorded previously was 5·39 in 1933, while the amount of gas unaccounted-for at the time the Gas Commission came into being varied between 13 and 15%. Mr. Aitken also stated that new records had been set up in the gas made per ton, the tar yield per ton of coal carbonized, the sale of coke, &c.

Burnley.

The financial result of the year's working is a gross profit of £39,620, and a net profit of £10,618 after due payment of capital charges, in comparison with £50,686 and £15,897 respectively last year. The total expenditure during the year has been £136,417, against £138,600 during the year 1933-34; and the income has been £147,035, against £154,497 the previous year. During the past year the Department has purchased 541,880,834 cu.ft. of gas from the Lancashire Foundry Coke Company, at a cost of £19,751. The expenditure on capital account during the year has been £6,671 3s. 8d. The Department contributed £10,000 towards the relief of rates. The make of gas during the year has been 452,282,000 cu.ft. of coal gas, and 15,933,000 cu.ft. of carburetted water gas. The Department has pur-

chased 541,880,834 cu.ft. of coke oven gas, making a total figure of 1,010,095,834 cu.ft., compared with 1,051,137,509 cu.ft. during the previous year. The gas sent out has been 1,011,262,834 cu.ft., or 5,056,314 therms, against 1,051,416,509 cu.ft., or 5,257,082 therms, during the previous year—a decrease of 3·82%. The production of coke during the year has met with steady sales, and the stocks have been considerably reduced owing chiefly to a larger local demand. The amount of coke produced has been 16,043 tons, of which 3,189 tons were used in manufacture, &c., leaving 12,854 tons for sale; 13,710 tons have been sold during the year, thus reducing the stock of coke by 856 tons. The quantity of coke sold the previous year was 13,460 tons. The net income for coke was £12,987, compared with £11,889 last year. The number of meters now in use is 32,811, an increase of 640 over the previous year. The number of new services laid during the year has been 549, while the number of additional services laid for exterior shop lighting is 31. There are now 215 miles of mains within the area of supply of the Gas Department The sales of appliances during the past year have been very satisfactory, and especially so in view of the continued depression in trade. The total sales amounted to £34,282, and are a record for the Department. Divided by the total number of consumers, the sales give an average of £1 0s. 10d. per consumer, which is a remarkably good figure.

Carlisle.

The new showroom has been open during the twelve months under review, and the sales of appliances show an increase of 27·92% over the corresponding year 1933-34. A total of 2,352 appliances were fixed during the year. The quantity of gas made and sold continues to increase, as the following figures show: 1934, gas made, 623,085,000 cu.ft.; gas sold, 582,346,890 cu.ft.; 1935, gas made, 642,076,000 cu.ft.; gas sold, 600,884,110 cu.ft. The yield of coke and breeze—21,465 tons, as against 19,925 tons for the preceding year—is equal to 12·89 cwt. per ton of coal carbonized; and the quantity sold, 14,850 tons, has realized £10,322—an increase of £777 over last year's sales figure. During the year 2,671 tons of tar were produced, an increase of 70 tons on last year's make, but, owing to lowering market values, the revenue from this by-product is £717 below that of the preceding twelve months. The financial results for the year, after providing for income-tax, loan repayments, &c., show a net profit of £4,621, as against a net profit of £767 for the preceding twelve months. In considering these figures, it should be remembered that the price of gas was reduced 3d. per 1,000 cu.ft. as from the September meter readings, 1933. The effect of this, on a full year's working, is a reduced revenue from gas sold of £7,000.

Dundee.

At a meeting of Dundee Finance Committee, on July 1, it was reported that the income for the year from the sale of gas exceeded the estimate by £3,025, but the receipts from residuals were less than the estimates by roughly £4,000. The total revenue was £1,050 less than the amount anticipated. On the expenditure side the net reduction under all sub-heads was £7,800, and when both sides of the accounts were taken together the net gain was £6,800. They had added £2,700 to reserve. The reserve fund, which now contained the non-statutory depreciation fund, now stood at £51,700, a considerable part of which would be needed soon for the provision of new retorts and other works. Net expenditure during the year was £27,089, of which £1,305 was defrayed direct from revenue. The net debt of the Undertaking was now £320,340, being £13,315 less than a year ago. Of the latter sum, £11,000 had been realized from the sale of the Commercial Street property. There was an increase in the sale of gas of some 26 million cu.ft., in spite of the fact that 8 million cu.ft. of consumption had been lost through the demolition of properties. It was proposed to make an alteration in the charges for gas for 1935-36 in respect of public lighting, from 2s. 2d. per 1,000 cu.ft. to 2s. per 1,000 cu.ft. for the first hundred million and 1s. 6d. per 1,000 cu.ft. thereafter. They estimated that as a result of this concession the income would be £1,200 less than a year ago. The total income from the Undertaking was estimated at £7,500 over last year's figures. Working expenses were in excess of last year's figures by £11,386, and coal was up by £5,476. The balance of increased expenditure was chiefly on account of additional and revised scales of wages. Expenditure on renewals and reconstruction was up by £2,695. This was a total excess over last year of £14,081. Overhead charges, inclusive of rates, were down by £5,412, giving a net excess expenditure of, roughly, £8,700. The concession in respect of public lighting would have its reflex in the consolidated rate.

Guernsey.

The audited statement of accounts of the Guernsey Gas Light Company, Ltd., for the year ended March 31, 1935, states that the balance at the credit of profit and loss account, after paying the interest on debenture bonds and making the allocations shown in the accounts, amounts to £13,346. The Directors have fixed the dividend at 17s. 6d. per share, which will absorb £6,563 gross, leaving a balance of £6,784, and this amount the Directors have decided to carry forward. The sale of gas during the year was 209,526,200 cu.ft., an increase of 8,013,700 cu.ft. over last year, while the number of consumers has increased by 531, making the total at the year end, 7,461, a record result. During the year the Company has renewed and enlarged its mains in various districts where inadequate supply of gas was experienced. The gas mains have also been extended in various parishes a total distance of 8,811 yd., making the total length at the year end 70 miles. In order to meet the cost of these extensions the Directors last March decided to issue 500 of the unissued £10 shares at a premium of £5 per share, and these were over-subscribed six times.

Heywood.

The balance-sheet shows that the gross revenue amounted to £34,285 and the gross expenditure (less interest and sinking fund) to £24,071, leaving a gross profit of £10,213 and, including £9,474 interest, sinking fund, and income tax, a net profit of £739, as against a profit last year of £1,108. The total capital expended during the year amounted to £1,231, made up of £1,173 on prepayment meters, and £58 for the extension of 3-in. cast-iron mains. The total quantity of gas manufactured was 792,679·5 therms, of which 91,125 therms was carburetted water-gas. During the year 8,424 tons of coal have been carbonized giving an average make per ton of 83·28 against 83·18 therms last year. The average calorific value of the gas supplied was 452·2 B.Th.U. (gross), the declared calorific value being 450 B.Th.U. The total sales of gas amounted to 701,485·70 therms, a decrease of 0·75% on 1934. There is a slight rise in the figure of "gas-unaccounted-for" from 9·54 to 9·87%. This is due to the increased pressure on the district. The quantity of coke sold was 2,297 tons as against 1,932 tons in 1934, while the net receipts show a reduction of £221. This is mainly due to the lack of efficient screening plant, involving increased labour costs to meet the growing demand for graded coke. The receipts from tar are £40 less than in 1934. The volume of business carried through at the showroom compares favourably with former years. Apart from miscellaneous sales, orders have been taken for 152 cookers, 25 fires, 83 wash-boilers, 75 water heaters, 189 irons. and 405 lighting units.

Leeds.

The gross revenue for the year amounts to £633,202 and the expenditure to £513,746, leaving a gross profit of £119,456. Out of this the Committee had to meet the following requirements: Income-tax, loan charges and bank interest, and contributions to capital amounting in all to £129,751, leaving a deficit on the year's working of £10,295. The quantity of coal carbonized during the year was 175,532 tons, as against 156,323 tons the previous year, an increase of 19,209 tons. This is due to the increased quantity of coal gas produced and also the extraction of benzole at Meadow Lane Works. The total gas produced was 3,026,740,000 cu.ft., as compared with 3,029,694,000 cu.ft.—a decrease of 2,954,000 cu.ft., or 0·09%. The gas produced per ton of coal was 15,261 cu.ft., compared with 16,268 cu.ft., a decrease of 1,007 cu.ft. per ton. This is more than explained by the extra amount of benzole produced. The gas sold was 2,872,827,000 cu.ft., as against 2,871,111,000 cu.ft. last year, an increase of 1,716,000 cu.ft., or 0·06%. The total quantity of benzole sold during the year was 425,738 gallons, the net income being £21,909 compared with 180,452 gallons sold during the previous year, which produced £9,142. This large increase is due to the new plant at Meadow Lane Works being in operation throughout the year. The number of ordinary meters in use on March 31 was 58,175, compared with 57,154 for the preceding year, an increase of 1,021. The number of prepayment meters in use on the same date was 88,645, as compared with 85,845, an increase of 2,800, making a net increase of 3,821. The total number of meters in use was 146,820. Under the new system of payment for appliances supplied with automatic meters, and the substitution of hire purchase for simple hire by ordinary consumers, 15,393 appliances have become the property of the consumer, which it is hoped will be an incentive for their retention and lead to a larger consumption of gas. The total sales of all appliances for cash and hire purchase amounted to £64,388, against £58,430 last year. The application of gas for commercial purposes has been considerably extended and 410 additional appliances fitted during the year. Central heating of buildings by gas-fired boilers has also been extended and a further 23 installations completed. There are now 95 central heating installations using gas-fired boilers and the gas consumption for these during the year was 50,128,700 cu.ft. During the year 66,262 yards of new mains have been laid in the city for the supply of gas to new property, and 1,515 yards laid in place of smaller and defective mains. The total length of mains in the area of supply is now 1,303 miles.

Leicester.

On Revenue Account the total receipts amounted to £525,380 and the total working expenses to £405,343, leaving a balance of £120,037. After the usual deductions there is a net profit of £5,930. The total quantities of coal carbonized and oil used during the year have been as follows: Coal, 117,853 tons; oil, 417,749 gallons. The receipts obtained from the sale of coke and breeze are higher this year than last. The total quantity of gas made at the two works during the year was 2,510,922,000 cu.ft., while the total quantity of gas delivered was 2,509,818,000 cu.ft. The total length of mains laid at March 31 was 538 miles. 21 miles of new main having been laid during the year. A further 1,869 consumers were connected during the twelve months, the total at the end of the year being 86,852. The number of domestic gas appliances acquired by consumers through the Department have increased by over 10,000 during the year and good business has been done by the Central and

Branch Showrooms. The Stove Department has handled over 13,850 gas cookers during the year, including stoves changed and new stoves fixed. The Department has made further considerable reductions in the price of gas for industrial and commercial uses, and since October last year the price of gas for central heating was reduced to 4d. per therm. The consumption of gas for these purposes is increasing, over 40 central heating plants having been installed to date, while gas is being used extensively in many other manufacturing processes. As from Jan. 1, 1935, a new alternative two-part tariff for domestic purposes was introduced and the response to date is very encouraging.

Lincoln.

The accounts of the Lincoln Gas Undertaking for the year ended March 31 last state that the year's working shows a gross profit of £18,741, service of debt and interest charges amounted to £17,479, leaving a net profit of £1,262, against £3,816 last year. The increased income is due to the profit on appliances sold under hire-purchase terms being £6,000 more than in the previous year, while residuals show an increased profit of £1,023. The cost of manufacture is £3,000 less, but distribution costs are £4,000 more than last year owing to the large increase in the number of appliances fixed during the year. The number of consumers of gas supplied through prepayment meters is steadily growing, there being 12,489 such consumers at the end of March, 1935, compared with 11,994 at the end of 1934—an increase of 495 in the year. The gas production for the year totalled 571,271,000 cu.ft., a decrease over the previous year of 2,799,000 cu.ft. This decrease is solely due to the mild weather experienced during the month of December, as up to that period the increase was more than 8 million cu.ft. The saving in the cost of manufacture of gas, as compared with 1931, when the old plant was in operation, is £16,414. The coming year promises to show a large increase in the industrial load, as some of the larger firms are changing over from oil to gas for furnace work. The new benzole plant, which is at present being installed, will also increase the production considerably. The Distribution Department has made what can only be described as remarkable progress during the past twelve months, as the following figures will confirm. New consumers added, 355, making a total of 18,650. New cookers sold during the year, 3,070, and 59 on simple hire terms. The number of cookers renovated and repaired, 2,340, making a grand total of cookers sent out during the year of 5,469. The total number of gas cookers in use at the present time is 13,452. The length of mains has been increased by over 10 miles. The total length is now 119 miles 416 yards. The value of appliances and fittings sold for the year was £35,527, an increase over the previous year of £25,082.

[*Further Undertakings' Results will be found on p.* 109.]

Book Review

Analytical Methods for the Investigation of Coke Oven Gas*

The Ruhrgas A.G. claims to be the largest selling organization for gas in Europe. Moreover, it derives its supplies from a considerable number of coke oven plants. It is, therefore, not surprising that accurate gas analysis is of paramount importance to this large concern. It is equally important from the point of view of the consumer, since it provides the means whereby the uniformity and purity of the gas are safeguarded. Obviously, then, it is to the interest of all that not only shall accurate methods of analysis be employed but that specified methods which have been found satisfactory shall be uniformly adopted by all concerned. The present booklet, now in its second edition, enables these objects to be realized, and, at the same time, it will prove of considerable interest to the gas and coke oven industries as a whole. The public spirit of the Ruhrgas A.G. in making their standard methods available to so wide a circle is much to be commended.

The scope of the book embraces sampling, determination of tar fog, ammonia, sulphuretted hydrogen, organic sulphur, cyanogen, naphthalene, oxygen, nitrogen, calorific value and specific gravity, and general gas analysis. In several instances, the technique described in the first edition has been modified in the light of experience and of recent research work.

Reference may be made to some of the methods employed, not necessarily on the ground of novelty but, at any rate, as a matter of interest.

Ammonia, sulphuretted hydrogen, naphthalene, and cyanogen are determined by passage of gas from a flowing stream through an appropriate reagent. A period sample, collected in an aspirator of 6 cu.ft. capacity, serves for the general gas analysis and for the determination of organic sulphur and nitrogen. Tar fog is determined by use of a tar filter of sintered glass which is inserted in a main through which gas is flowing. Oxygen is determined on a snap sample. Calorific value and specific gravity tests are carried out on spot samples and serve, primarily, to check the recording instruments which are generally part of the works' equipment.

Of interest is the Plenz regulator employed for securing a constant outflow of water from the aspirator in which the period sample is taken. The regulator is provided with a series of interchangeable nozzles which enable a coarse adjustment of the rate of collection of the sample to be made. Intermediate rates are obtained by variation in the length of the valve stem and consequent alteration of the position of the water level in the float chamber of the regulator.

Organic sulphur is determined by burning 3½ to 5 cu.ft. of a period sample of the purified gas with oxygen at a rate of 0·5 to 0·75 cu.ft. per hour in an apparatus of transparent silica provided with a platinum star, the combustion products being passed through alkaline hydrogen peroxide.

Cyanogen Determination.

For cyanogen determinations, 3½ cu.ft. of gas are passed through alkaline ferrous sulphate at a rate of 2 cu.ft. per hour. The reaction product is boiled and filtered, the residue being extracted with caustic soda. The combined filtrates are transferred to a distilling flask, neutralized with sulphuric acid, treated with caustic soda and magnesium chloride and boiled. A boiling solution of magnesium chloride and mercuric chloride is added, the ferrocyanide being thus converted into mercuric cyanide. Sulphuric acid is then added drop by drop and the prussic acid is distilled into caustic soda contained in a ten-bulb absorption tube. The HCN is then titrated with silver nitrate solution in presence of potassium iodide.

For the determination of naphthalene, the picric acid flasks are cooled in ice and water in accordance with recent recommendations to this effect.

The manganous chloride method is employed for the determination of oxygen, the apparatus being a bulb of ⅕ cu.ft. capacity provided with a dropping funnel for admission of the reagents. A solution of manganous chloride is first introduced into the apparatus which has been filled with gas and is followed by a solution of potassium iodide and Rochelle salt. The apparatus is mechanically shaken for 1½ hours, after which the reaction product is acidified and titrated with thiosulphate solution. The Jaeger method is employed for the estimation of nitrogen. The method recommended for the general analysis of the gas is a conventional one, the Ruhrgas model of the Orsat apparatus being employed since it enables results accurate enough for operating purposes to be obtained.

Full particulars of the use and adjustment of the Junkers calorimeter are given together with a chart which enables corrections to be made for the humidity of the combustion air. Factors which may give rise to errors in the determination are discussed, and the means to be adopted for obviating them are indicated.

The Zipperer model of the Bunsen-Schilling apparatus is recommended for the determination of specific gravity. A correction chart enables the result to be converted to the dry basis.

Useful features of the book are the provision of blank pages in which new or additional methods may be recorded and the inclusion of the names of suppliers of approved patterns of the various forms of apparatus described. The size of the book has been kept small by the exclusion of any matter explanatory of the methods employed, the treatment being purely descriptive. This is no drawback, since, in most cases, the reader will be familiar with the principles involved.

The price is somewhat high in relation to the size of the book but the value of the information more than compensates for this.

* Analytische Methoden für die Untersuchung von Kokereigas. Herausgegeben von der Ruhrgas A.G., by W. Wunsch and H. Seebaum. Second Edition. [Essen, 1933, Vulkan-Verlag, Dr. W. Classen. Pp. iv. + 52, interleaved. Price RM. 8·80, bound in stiff paper.].

The Hassocks and District Gas Order

Application for Statutory Powers

Having regard to the provisions of the Act of 1934, by which it becomes compulsory for many non-statutory undertakings to secure statutory powers, the Special Order promoted by the Hassocks and District Gas Company, Limited, which seeks to place the Company on a statutory basis, is of particular interest, since it is the first such application since the passing of the 1934 Act. Indeed, the matter was under consideration by the Company before the Act was passed.

The Order was the subject of enquiry on Friday, June 28, at the Hassocks Hotel, Hassocks, Sussex, by Mr. J. F. Ronca, O.B.E. (Director of Gas Administration at the Board of Trade). It provided for the authorization of additional capital, the application of the thermal basis of charge with a sliding scale of price and dividend, and defined the area of supply. There are also a number of usual provisions, including powers to form renewal, reserve, and special purposes funds.

The East and West Sussex County Councils asked that certain agreements made with the Company governing the breaking up of roads should still apply; but the Company's answer was that when the undertaking became statutory, the Gas-Works (Clauses) Acts afforded ample protection. A few of the inhabitants of Hassocks also made representations, fearing nuisance arising from the extension of the gas works plant.

The Company was represented by Mr. H. I. Willis; and the County Councils by Mr. S. Cope Morgan.

Mr. WILLIS said that the Hassocks and District Gas Company, Ltd., was incorporated in January, 1929, by an amalgamation of two non-statutory gas companies—the Keymer and Ditchling Gas Company, Ltd. and the Hurstpierpoint Gas Company, Ltd. These two former companies had been established since 1867 and 1860 respectively, and had carried on their businesses successfully. In 1931 there was a further amalgamation, when the Hassocks Company took over the Henfield Gas and Coke Company, Ltd.

The present area of supply, he said, covered the parishes of Hurstpierpoint, Hassocks, Keymer, Ditchling and Henfield; it was extensive, and comprised small centres of population separated from each other by large tracts of rural country. In those intervening tracts there were only very small numbers of consumers. In 1934 the total number of consumers was 1,472; the amount of gas supplied to ordinary consumers was 21,031,900 cu.ft., the amount to prepayment consumers was 13,238,700 cu.ft., and there was also a public lighting supply to the extent of 1,426,300, making a total of 35,696,900 cu.ft. supplied.

The Works at Hassocks were built originally by the old London, Brighton and South Coast Railway Company, and were leased to the Keymer and Ditchling Company, in 1885, for a period of 73 years. It was proposed that the Hassocks Company should purchase the freehold. Centralization of manufacture of gas at the Hassocks Works had been effected since the amalgamations; but it was possible, for reasons of space, that necessary future expansions at the Hassocks Works might be impracticable, and the Company sought statutory powers to manufacture also at Hurstpierpoint and Henfield (where gas had been manufactured prior to amalgamation) if necessary.

The normal capacity of the existing coal gas plant was 160,000 cu.ft. per 24 hours. During the past year the peak consumption had practically reached that figure, and a supplementary supply had been obtained by the installation of blue water gas plant of a maximum capacity of 80,000 cu.ft. per day; but, of course, only a part of that was available for admixture with the coal gas. There were gasholders at Hassocks, Hurstpierpoint, and Henfield, but there was very serious shortage of storage capacity.

The Directors of the Company had been considering during the past two or three years an application for statutory powers; it was only fair to say that they had decided on that policy before the passing of the general Act of 1934, which made such an application compulsory in the case of a Company such as the Hassocks Undertaking.

There was no opposition by anybody, either local authority or individual, concerning the limits of supply as defined in the Order. One of the proposals in the Order was to repeal powers held by the Brighton, Hove, and Worthing Gas Company to supply in the parish of Clayton; the Brighton Company had never exercised its powers there, and the Hassocks Company had supplied there for years. Thus, the repeal of the Brighton Company's powers in that area was an academic matter. The limits of supply of the Hassocks Company as defined in the Order were within the rural districts of Chailey, Cuckfield, Chanctonbury, and Horsham, within the counties of East Sussex and West Sussex. The Company had adopted as its statutory area of supply this part of central Sussex which was not within the statutory area of any other undertaking.

The capital of the Company, when formed, was £25,000; in December, 1930, it was increased to £40,000, and in January, 1935, to £60,000. It was asked that the £60,000 should be authorized statutorily as share capital, to comprise the £31,200 ordinary shares already issued, and the remaining £28,800 as additional capital. Borrowing powers to the extent of half the issued share capital were provided for in the Order. An expenditure of nearly £20,000 was necessary immediately, not for the purpose of giving additional supplies, but to ensure that present supplies were effective; and a further expenditure of £40,000 was contemplated in the next 15 years. It was proposed that the standard dividend should be 7% on ordinary shares, but where fresh capital was issued as preference capital, the dividend should be 6%.

None of the rural district councils was raising objections either to the area or the prices to be charged for gas. Representations had been made by Imperial Chemical Industries, Ltd., but that organization was not represented at the enquiry, and Counsel did not appreciate that they could have any *locus standi*.

Dealing with the opposition of the East and West Sussex County Councils, he said it was complained that the Order would confer on the Company power to break up and interfere with roads under the jurisdiction of the County Councils, and that the Order contained no adequate protection for the County Councils in respect of the maintenance and repair of roads and bridges. Mr. Willis disagreed; he emphasized that the Order incorporated the Gas-Works (Clauses) Acts, which Parliament and the Board of Trade had said were sufficient, and the claim that the provisions of those Acts were not adequate was not maintainable. There were no exceptional circumstances in regard to the position of these County Councils and no exceptional circumstances in the area which would justify imposing on the Company any protective clauses in favour of the County Councils over and above the protection afforded by the general Acts. The matter had been threshed out before a Select Committee of the House of Lords in 1925, in connection with the Northampton Gas Order, when the Committee had concluded that there was no justification for imposing protective clauses in favour of County Councils. One small concession in that case was in regard to the length of notice given before breaking up roads.

Mr. COPE MORGAN said that the Hassocks Company had not conceded it in this case.

Mr. WILLIS replied that if the County Councils stated that they wanted such a concession, consideration would be given to it.

A point raised by the East Sussex County Council was that in the portion of Clayton which was at present within the statutory limits of supply of the Brighton Company the Council were protected in respect of county roads and bridges by a clause in the Brighton, Hove, and Worthing Gas Act of 1910, and that if the present Order were approved, the Council would not have that protection. But Mr. Willis emphasized that the Brighton Company had not laid any mains in Clayton under that clause, and he asked that the Board of Trade would not impose any special protection on the Hassocks Company in respect of this parish merely because the Brighton Company were under an obligation but had never supplied there at all. It was very undesirable that there should be different codes, relating to the breaking up of roads, applying to different parts of the Hassocks Company's area.

Individual Objections.

With regard to objections by individuals, Counsel said that 426 notices were sent out concerning the Company's proposals and giving an opportunity to those receiving them to make representations to the Board of Trade. Only six, however, had made representations. Further, Counsel pointed out that the Company was not seeking power by the Order to build gas-works or store gas on any land not now being used for such purposes.

A RESIDENT remarked that there was anxiety to ensure that there would not be increased smell from the works.

Mr. WILLIS replied that there was no intention of increasing smell as the result of the Order. Further, if this or any other gas company so conducted its business as to become a nuisance there was a remedy under the Gas-Works (Clauses) Acts.

One of the objectors had never made objections before, although the gas-works had existed for 60 years. The house was built after the establishment of the gas-works.

Another objector had suggested that the new gasholder would be dangerously near the houses around, and should be erected on land further from dwelling houses. The house of that objector was also situated on the other side of the railway from the gas-works, and was erected after the gas-works.

Mr. RONCA pointed out that three of the objectors had not forwarded their objections to the Board of Trade by registered letter, as directed by the notices sent to them.

Mr. WILLIS said that, strictly speaking, the representations of those objectors ought to be disregarded, but he had thought it fair to refer to them.

Mr. Willis said the Company proposed by the Order to include within its statutory area two parishes (Cowfold and Partridge Green) which the Company was not at the moment supplying.

Mr. *W. Wood* (Vice-Chairman of the Company) gave evidence.

Mr. COPE MORGAN, in cross-examination, said that under the Order the Company would be empowered to maintain and use the pipes they had laid down already, by agreement, as if they had been laid under the powers of the statutory Order. He

asked why the Company desired to go back on the agreements made with the East Sussex County Council.

Mr. *Wood* replied that the Company did not want to; they would not have made the agreements if they had had statutory powers.

Mr. COPE MORGAN, having obtained agreement from witness that it was the desire to give the County Council less protection in respect of the roads covered than was given by the agreements, asked what justification there was for going back on the bargain in respect of these roads.

Mr. *Wood* replied that under the law the County Council would receive ample protection.

Asked if he thought that three days was adequate notice of intention to carry out street works, Mr. Wood said it was long enough for the Gas Company, and the County Council should be able to move within three days.

Mr. COPE MORGAN suggested that the Hassocks Company had refused to give the County Councils the protection they asked for simply because, in the recent Steyning Gas Order, the West Sussex County Council had not contested the matter.

Mr. *Wood* replied that that was a good reason, and it had weighed with him. It was unreasonable to put in a protective clause if the work of the Company could be carried on properly without it.

Mr. *James Robinshaw* (Engineer, Manager, and Secretary of the Company) also gave evidence and corroborated Counsel's statements, and said the peak consumption last year was within 5,000 cu.ft. of the output capacity of the ordinary coal gas producing plant. The provision of an additional holder was imperative.

Witness gave details of the proposed expenditure.

Mr. *A. W. White*, F.C.A. (of Messrs. Cash, Stone, & Co., Chartered Accountants), who had advised the Company, submitted a number of statements showing the financial position of the Company, and justifying the proposed standard price and differential.

Evidence for the County Councils.

Mr. *E. D. Averay* (Deputy County Surveyor, East Sussex County Council), in evidence, emphasized the importance of locating a main in a road having regard to the immediate and prospective user of the road. He said it was not their practice to require that all attachments under the roads should be at a depth of 2 ft. 6 in., but there were circumstances where it might be necessary. Three days was not sufficient notice to a County Council when a gas company proposed to open roads. A notice had to be sent to the divisional engineer for his report, so that two days elapsed before headquarters could reply to the company's notice.

Mention was made also of a case in which West Sussex County Council had had to refuse permission to attach a large gas main to a steel bridge, because the bridge was not strong enough. It was very necessary that the highway authority should have powers to stop that.

Mr. WILLIS, cross-examining, asked if it were seriously suggested that, without the protective clause asked for by the County Councils, there would be difficulty in making satisfactory arrangements with the Company concerning the laying of mains.

Mr. *Averay* replied that possibly there would not be difficulty about laying of mains, but there might be difficulty in the event of alteration of levels or of the character of the road surfacing.

Mr. WILLIS pointed out that under the terms of the Gas Works (Clauses) Acts the Company would have to submit a plan showing the position of any main proposed to be laid; any disputes arising would be settled by arbitration. He also pointed out that no gas undertaker had the power to touch the structure of a bridge without consent from the highway authority.

Mr. COPE MORGAN, in his address on behalf of the County Councils, said there was not the slightest attempt in evidence by the Gas Company to suggest that any single item of protection which the Councils asked for was in any sense unreasonable. With regard to Clayton, there was no precedent to deprive the County Council of the protection which Parliament had given in the Brighton Company's Act; it would be improper to over-rule Parliament and to allow a successor to come in on terms different from those laid down by Parliament. Conditions with regard to roads had altered since the Gas Works (Clauses) Act of 1847 was passed. It was against all precedent, and it was not sound, for people to be able to throw off their obligations merely because they chose to get into statutory clothing instead of that of poachers.

After Mr. Ronca had discussed the Company's proposals with the individual objectors,

Mr. WILLIS summed up for the Company. He made a strong protest against Mr. Cope Morgan's suggestion that the Company had gone back on their bargains, and said there was not a shred of justification for any of the observations made on that matter. The protective clause given in the Brighton Company's Act with regard to Clayton was totally irrevalent, because the Hassocks Company were not taking over the Brighton Company's undertaking there, and the mains laid there by the Hassocks Company were not laid under the terms of that clause. There was nothing improper, when the Hassocks Company became statutory, in applying the statutory provisions instead of the agreements entered into formerly. Indeed, the second agreement provided that it should remain in force only until the Company became statutory.

The Steel Cartel Agreement

The conclusion of an agreement between the British Iron and Steel Federation and the Continental Steel Cartel is an important event in the affairs of the iron and steel industry of this country, and it is perhaps no less important in its way for the Gas Industry.

It is quite obvious that any effect upon the sale of gas to the metal industries must, of course, be local; it will affect Sheffield and Birmingham, for example, more than the residential areas. The increasing use of gas in these industries is nevertheless one of the most encouraging features of the industrial gas load. The protective effect of the gaseous atmosphere during the heating process has been recognized right from the earliest days of the use of gas in the metal industries, and without doubt has proved a very valuable stimulus to the sale of gas for this purpose. In recent years a tremendous amount of research has been carried out into processes of furnace atmosphere control, and to-day the results of this work are adding greatly to the value of gas in industrial work of all kinds. The agreement recently reached with the Continental Cartel is to run for not less than five years—with an option of cancellation at the end of three years—from Aug. 8 and provides for the import of a maximum of 670,000 tons of Cartel steel for the first year and 525,000 tons per year thereafter. This means that the net increase of tonnage secured by British works on the assumption that home steel requirements remain constant will be 400,000 tons annually. So far as the export market is concerned, the position is unchanged from the 1934 percentage, but something has been gained by the participation of the British steel interests in the orderly partition of the export market; presumably price-cutting will be reduced appreciably, so that what work is undertaken will at least be remunerative. There are many firms, and those not confined to firms outside this country, that are beginning to realize that it is better to do half their normal maximum output at remunerative prices, than to fill their works with orders at prices that do not leave sufficient gross profit even to pay overhead expenses.

Wild and extravagant statements have been made in the daily Press concerning the beneficial effect of this agreement on the British steel industry; the facts are as set forth in the foregoing paragraphs. From the point of view of the Gas Industry as supplier of heat to the metal industries we have to recognize that there is business to be gained from an additional 400,000 tons of steel per year. The percentage of the export business has also been stabilized, so that if the world steel requirements do not decline, at least there will not be less business going. The Gas Industry, therefore, must fight for whatever business it can secure in the conversion of existing furnaces and must not expect great increments from new business. It is a striking fact that, while world steel production has been increasing rapidly, British steel production has hardly moved for many years past. Between 1871 and 1901 the British output of steel increased from 329,000 tons to 4,900,000 tons, a total of 1,500% in 30 years. The production in the rest of the world during that time—excluding America which had an internal demand outside the scope of continental nations and in which they could not participate—increased from 290,000 tons to 12,190,000 tons, an increase of 4,200%. If the years 1927 to 1930 be taken as typical of the post-war steel demand, and the years 1910 to 1913 as the maximum normal British pre-war production, it will be found that during the pre-war period the British output had risen to 6,820,000 tons (though of course it exceeded 9 million tons during the war and in 1920)

while the foreign figure (with the same reservations as before) became 31,520,000 tons; the British figure had increased over the 1901 total by 39%, while the equivalent "foreign" increase was 160%.

Similarly in the post-war years of 1927-30 the British figure became 8,650,000 tons, a further increase on 1910-13 figures of 27%; the "foreign" figure was 47,800,000 tons, an increase of 51%. Finally for 1934, at which conditions appear for the time being to have become more or less stabilized, the British production has increased slightly to 8,860,000 tons, while the foreign output has taken another jump to 56,750,000 tons. Put in another way, the world market outside the U.S.A. and Great Britain has increased from 1913 to 1934 at an average rate of 1,200,000 tons a year, while the British rate during the same period has been 97,300 tons a year. The disparity is striking in view of the fact that we were once pre-eminent as steel makers. It throws into relief the relative importance of an increased production of 400,000 tons that is guaranteed by this Cartel agreement, and it also indicates the need for a further expansion of our export market—an expansion that may be difficult to compass in view of the present agreement. The Gas Industry is not a primary industry in the sense that it can only prosper in proportion as its customers prosper; the business prospects of those who are large purchasers of gas must inevitably be a matter for the keenest interest of all gas engineers. From another, purely selfish, point of view the Cartel agreement is likely to be advantageous in that without this agreement the tariffs on imported iron and steel would have been increased substantially and there is more than a possibility that internal prices would have advanced; that danger is now avoided, at least so far as this particular reason is concerned.

Gas and the Baking Industry

By W. Ellerd-Styles

An extract from a Lecture given to the Woolwich Master Bakers on June 13 in which the advantages of gas for the baking industry are ably set out.

In oven design there are two main principles of construction—one in which a large amount of brick and other heat absorbing material is included, such material acting as a heat reservoir to equalize variations in the baking chamber temperatures which may arise through irregularity in the rate at which heat is supplied to the oven. The other principle in oven design is to subject the rate at which heat is supplied to the oven to automatic or manual regulation, relying on such regulation to maintain the required temperature.

If the heat flow can be controlled effectively, heat reserve in the oven is not essential to maintain uniform temperature and the cost of operation is low. For such ovens thermostatic control is advantageous, the thermostat being set so that the heat source is not entirely disconnected at any time unless the main supply is cut off manually. Thermostats of modern design will operate over a very close range—approximating 1%.

Thus the oven will regulate itself and permit the operative to restrict his attention to setting the thermostat at the required position for baking various goods.

Gas is the only fuel providing regulation from zero to maximum for these requirements at a cost which is consistent with efficient operation, and for this reason it is the fuel which the baking industry will use on a very extensive scale. Further modifications in design include the provision of heat absorbing material sufficient to provide the so-called solid heat, and as the oven is insulated in an efficient manner excellent performances are obtained.

Firing of Side-Flue Ovens.

It is now possible to fire side-flue ovens with gas, and although the cost is admittedly higher than with coal or oil firing the attendant advantages more than compensate for the extra cost, which does not exceed 25%. In favourable districts the cost barely exceeds the cost of firing by coal or oil.

In addition, gas firing offers many advantages. Its extreme cleanliness is important when dealing with food production. It eliminates entirely fuel handling, also ashes, soot, and dust. It does not contaminate butter and fats.

Heating up is rapid, and the maximum heat input is obtained immediately the gas is switched on. Flashing the oven between batches is simplicity itself. Temperature regulation becomes an easy matter, and the usual scuffling is eliminated except for removal of burnt cones.

Reliability is an important factor depending only on the supply of gas and the natural draught of the chimney; no fans, pumps, electric motors, or other extraneous equipment are required.

The burner is of the single luminous jet type inserted through a plate bolted on in place of the firebox door. It is so constructed that its position in the oven and its inclination can be adjusted to the conditions existing. The gas consumption on a 10 ft. by 8 ft. side-flue oven is about 700 cu.ft. hourly, and figures have been obtained averaging 600 cu.ft., or 3 therms, per sack.

The development of gas firing for side-flue ovens is due to the Gas Light and Coke Company. The system was made a commercial proposition, and I believe Mr. Gordon Blain, Managing Director of Messrs. A. Walkling, Ltd., was the pioneer user. The long furnace type of steam tube oven which, strangely enough, is still referred to as a patent oven, is notoriously difficult to fire uniformly. As is well-known, these ovens have a long narrow furnace and firing is arranged on the bottom row of tubes.

A Recent Tendency.

In recent years the tendency has been to design small furnace ovens which involve more expensive construction. Consequently, for cheap construction the long furnace oven with straight tubes is still marketed. Gas firing can be applied to these ovens with highly satisfactory results, and existing ovens of this type can be converted to gas-firing effectively. Such ovens when gas-fired become vastly improved. It permits the use of one baking chamber only when desired and also enables top and bottom heat to be independently controlled. If luminous bar burners are employed extreme flexibility of heating is obtained without the risk of blowing back in the burner.

Consequently, ovens of this type, which hitherto gave anxiety as regards firing difficulties, can with the aid of gas become highly efficient units comparing in performance with the more costly small furnace ovens with bent tubes.

An important feature with gas firing is the entire elimination of frequent furnace re-linings. The ovens remain scrupulously clean, and the usual wastage of oven tiles adjacent to the furnace of side-flue ovens is non-existent.

Montevideo Gas and Dry Dock Company, Ltd.

Ordinary General Meeting

The Sixty-Third Ordinary General Meeting of the Stockholders of the Montevideo Gas and Dry Dock Company, Ltd., was held at the London Offices of the Company, Dashwood House, Old Broad Street, E.C., on Tuesday, July 2—Mr. FRANK H. JONES, M.Inst.C.E. (Chairman of Directors), presiding.

The LONDON MANAGER AND SECRETARY (Mr. H. Kearns) having read the notice convening the meeting, together with the Report of the Auditors, the minutes of the last Ordinary General Meeting were taken as read; and the CHAIRMAN proposed the adoption of the Report and Accounts for the year ended Dec. 31, 1934.

In doing so, he remarked that all the items in the Balance-Sheet had, as in the previous year, been reduced to their actual sterling equivalents, and it would be seen by the note at the foot that, to do this, they had had to provide for loss on exchange the heavy sum of £107,963, of which £20,675 had been transferred from the Exchange Contingency Fund, £52,081 was provided to December, 1933, and a further £35,207 in 1934. Owing to the necessity of keeping down capital expenditure, the total of £763,712 showed a reduction of £10,806, the expenditure amounting to only £2,446, while the depreciation and obsolescence equalled £13,252.

Sundry debtors were reduced by £15,733, partly due to amounts received from Government and Municipal Departments in payment of their gas accounts, and to the prompt payment by their customers for work done in the Dock Department, and also to the unfortunate fact that £25,597 had to be provided to write down the outstanding amounts to their exchange value of 25d. as compared with £18,294 in 1933.

English investments had been reduced by £5,356, it having been necessary to sell some to meet the requirements of coal and materials, the remittances from Montevideo being insufficient. They were obliged to sell securities for the reason that their 5% and 6% debenture stock trust deeds, while giving the Company power to sell, did not allow securities to be pledged as security against loans, and to overcome this anomaly they called meetings of the 5% and 6% stockholders in March last, at which resolutions were passed giving the necessary powers, which would be in the interests of the holders as well as the Company.

As mentioned last year, in order to release some of their accumulated dollars and to convert them into sterling, they had a holding of £140,000 of the 5% and 6% 5 year Uruguayan Bonds, and the amounts shown in the Balance-Sheet represented

their sterling value after receipt of 25% which had been amortized up to December last. A further 20% was received on July 1, and out of this it was proposed to pay a dividend of 3% free of tax for the year 1932.

Increased Receipts.

Notwithstanding the difficulties under which the Company were working, it was gratifying to see that receipts in currency showed an increase of $68,821.00, which, converted at the higher rate of exchange ruling during the year, gave an increase in sterling of £32,430, and allowing for the increase in expenditure, partly owing to the larger amount of work in the Dock Department, and the amount provided for exchange reserve and loss on exchange, it gave an increased balance of revenue of £6,921, which they considered satisfactory under the circumstances.

Although they had a small increase in the number of consumers, the gas sales were 2·51% lower.

They had for some years constructed in their workshops, continued the Chairman, all the gas cookers lent on hire or sold on monthly instalments, and they were now producing geysers of their own design which were meeting with an increasing demand on the three-year purchase system, which was resulting this year, so far as they had returns, in a satisfactory increase in the sales of gas.

Were it not for exchange losses they could look forward to a still further increase in business and profits, but, as they knew, there were three rates for exchange—the official rate of about 38d., at which rate they were allotted a certain amount for remittances, but which this year had been greatly curtailed; the official controlled rate of about 22d., at which rate they were now receiving the greater portion of their remittances, and which gave them a mean average for the dollar of 25d. instead of the par value of 51 1/8d.; and there was the free rate of about 19½d.

While these depreciated values continued their difficulties would not be reduced. If there was not sufficient British exchange available out of the British purchases from Uruguay, they suggested to the Authorities for their consideration that, as the Company's service was rendered to residents of all nationalities, some portion of the exchange created by the purchases of other countries should contribute to services which were of a national character.

The CHAIRMAN then formally moved :

> That the Report and Accounts now presented be received and adopted, and that a dividend be and the same is hereby declared on the ordinary stock of the Company for the year ended Dec. 31, 1932, of 3%, free of income-tax, payable on July 3, 1935, to the stockholders on the register on June 19, 1935.

The resolution was seconded by Sir EDGAR HORNE, Bart., and unanimously adopted, after which the retiring Director (Mr. F. H. Jones) was re-elected, as also were the Auditors of the Company (Mr. L. E. Halsey, F.C.A., and Mr. Wilfred Harrison, F.C.A.).

The meeting closed with hearty votes of thanks to the officers and staff of the Company both in London and Montevideo and to the Chairman and Directors for their services during the year.

Gas Undertakings' Results

Cockermouth.

Mr. A. F. Young, Engineer, Manager, and Secretary of the Cockermouth (Cumberland) Urban Council, states in his annual report that the mains, meters, and cookers had cost £140 more than the amount spent last year, which had reached a very high figure. This was not to be deplored, as it proved the Undertaking was still equipping itself for the future. In gas the revenue from ordinary meters was £272 less than last year, but as the closing of the Poor Law Institution had meant a loss of £200 per year, the reason was not far to seek. The income from slot meters was £180 and from stove hire £84. The total gross income for the year was £9,099, which was about £7 less than last. The items for expenditure were about the same as last year. There was a gross balance of £1,410.

Wells.

The Directors report to the stockholders of the Wells Gas Light Company for the year ended March 31, 1935, states that although last winter was remarkable for the mild weather prevailing, adversely affecting the sale of gas and the accounts bear the result of the increased rate assessment of the Company's property (over 100%), yet improved business in connection with the sale of residuals and gas apparatus, &c., coupled with good working, have produced the results as shown in the accounts. Carbonizing results continue at the high standard of previous years and the "unaccounted-for gas" remains low. Sales of appliances were as follows: 69 high-grade cookers and hotel appliances, 19 wash boilers, 40 boiling rings and gas irons, 16 water heaters, 48 fires and radiators, and 260 lighting points with 60 switches. The gross receipts for the year amounted to £14,129, and the expenditure to £11,008, leaving a balance profit of £3,121, as compared with £3,267 in 1934. The credit balance of profit and loss account to be carried to the next account is £2,582. The Directors recommend the payment of final dividends for the year as follows: On ordinary and preference stock at the rate of 2½%; on new (1925) preference stock at the rate of 3¼%, making with interim dividends paid in December, 1934, 5% and 6½% for the year, less tax. To carry £480 16s. 10d. to the credit of renewal fund account, carrying the balance forward to the credit of next year's account.

[*Other Results on p.* 103, *&c.*]

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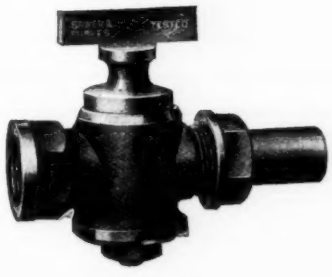

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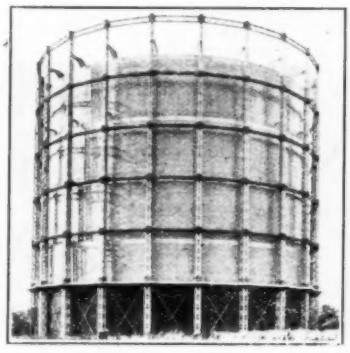

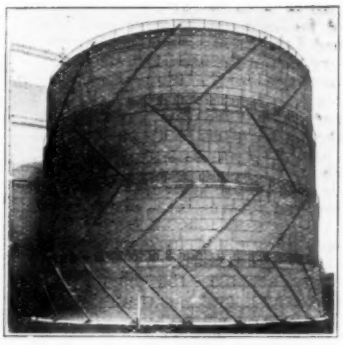

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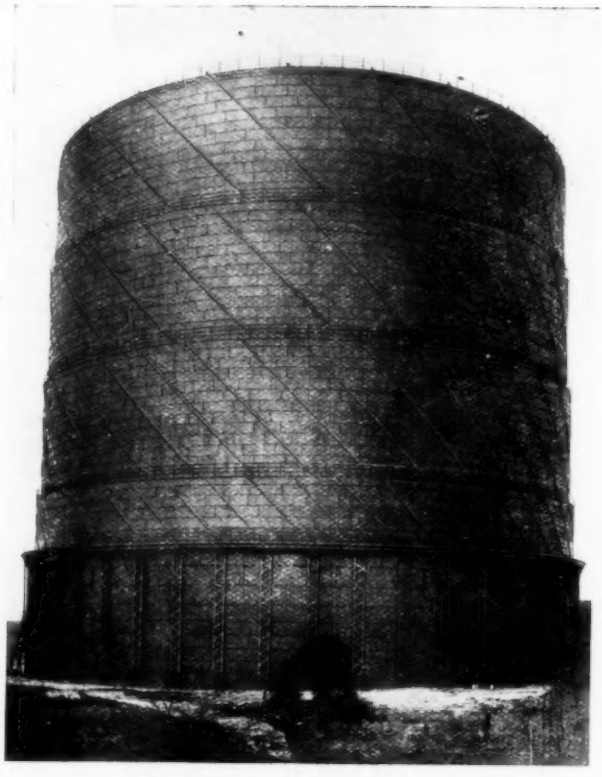

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Gas Markets and Manufactures

Stock Market Report

(For Stock and Share List, see later page)

Active conditions still continued on the Stock Exchange during the greater part of last week, and though business eased up a little towards the close, owing to the end of the Account, a resumption of brisk dealings is anticipated for the current week. British Funds were again a bright feature, and all showed improvement on the week, while the latest good traffic returns have awakened a considerable interest in the Home Rail market and several of the senior stocks were marked up. A heavy investment buying of the recent home corporation new issues was in evidence, and all these now stand at a premium, Manchester 3% issued at 99 going to 2⅝. The half-yearly banking dividends were announced during the week, and the rates in each case are the same as those paid for the December half-year.

The volume of business in the Gas Market was considerably heavier, and though in a number of cases stocks were purchased at prices above the previous week's best there were very few changes in the quotations. Bournemouth sliding-scale headed the list with a gain of 5 to 230, and Croydon 5% maximum was moved up 3 to 117½. Business in the latter was done at 118, and a purchase at this price constitutes a satisfactory permanent investment yielding £4 4s. 8d.%, which is still a higher return than that obtainable on a similar class stock of one or two Provincial undertakings. The only other increase of note was a rise of 1s. 6d. to 30s. in Bombay £1 shares.

The Directors of the European Gas Company announce that the conditions of the recent offer made to the proprietors by Messrs. R. de Lubersac & Cie., referred to in the Report published on June 19 last, have been complied with, so that the agreement for the transfer of the Company to French hands now becomes absolute.

Current Sales of Gas Products

The London Market for Tar Products.

July 8.

There are no changes to record in the prices of Tar Products, which remain as follows:

Pitch is nominal at 35s. per ton f.o.b.

Creosote, about 5¾d. to 6d. per gallon.

Refined tar, 4d. per gallon in bulk at makers' works.

Pure toluole, 2s. 2d. to 2s. 3d.; pure benzole, 1s. 7d. to 1s. 8d.; 95/160 solvent naphtha, 1s. 5d.; and 90/160 pyridine, about 4s. 6d. to 4s. 9d.—all per gallon naked at works.

Tar Products in the Provinces.

July 8.

The average prices of gas-works products during the week were: Gas-works tar, 18s. to 23s. Pitch—East Coast, 31s. to 33s. f.o.b. West Coast—Manchester, Liverpool, Clyde, 31s. to 33s.* Toluole, naked, North, 1s. 8d. to 1s. 9d. Coal-tar crude naphtha, in bulk, North, 6¾d. to 7d. Solvent naphtha, naked, North, 1s. 5d. to 1s. 5½d. Heavy naphtha, North, 9½d. to 10½d. Creosote, *ex* works, in bulk, North, liquid and salty, 5¾d. to 5¼d.; low gravity, 5d. to 5⅛d.; Scotland, 5d. to 5⅛d. Heavy oils, in bulk, North, 5d. to 5¼d. Carbolic acid, 60's, 1s. 11d. to 2s. Naphthalene, £10 to £11. Salts, 60s. to 75s., bags included. Anthracene, "A" quality, 2¼d. to 3d. per minimum 40%, purely nominal; "B" quality, unsalable.

* All prices for pitch are now quoted on the basis of f.o.b. In order to arrive at the f.a.s. value at any port it will be necessary to deduct the loading costs and the tolls whatever they may be.

Tar Products in Scotland.

GLASGOW, *July* 6.

With few exceptions prices are well maintained in this district, although the volume of new business being placed is not great.

Crude gas-works tar.—The actual value is 28s. to 30s. per ton *ex* works in bulk.

Pitch remains a dull feature at 37s. 6d. per ton f.o.b. Glasgow for export, and 35s. to 37s. 6d. per ton *ex* works in bulk for home trade.

Refined tar is now moving in greater quantities at about 3d. per gallon f.o.r. makers' works in buyers' packages.

Creosote oil continues rather scarce and prices of all grades are firm. B.E.S.A. Specification, 5⅛d. to 5⅜d. per gallon; low gravity, 5¼d. to 5½d. per gallon; and neutral oil, 5¼d. to 5½d. per gallon; all f.o.r. in bulk.

Cresylic acid.—Quotations are steady, but new business is scarce. Pale, 97/99%, 1s. 1½d. to 1s. 2½d. per gallon; dark, 97/99%, 1s. to 1s. 0½d. per gallon; and pale, 99/100%, 1s. 2½d. to 1s. 3½d. per gallon; all *ex* works naked.

Crude naphtha.—Available supplies command 4½d. to 5d. per gallon, according to quality and district.

Solvent naphtha.—90/160 grade is 1s. 3½d. to 1s. 4d. per gallon, and heavy naphtha 90/190 is 10½d. to 11½d. per gallon.

Motor benzole is commanding 1s. 3d. to 1s. 3½d. per gallon in bulk at makers' works.

Pyridines.—90/160 grade is 5s. 6d. to 6s. per gallon, and 90/140 grade 6s. to 6s. 6d. per gallon.

Benzole Prices.

These are considered to be the market prices for benzole at the present time:

	s. d.		s. d.	
Crude benzole	0 9½	to	0 10	per gallon at works
Motor "	1 3	"	1 3½	" " "
90% "	1 4	"	1 4½	" " "
Pure "	1 7½	"	1 8	" " "

Contracts Advertised To-Day

Coal.

Dukinfield Gas Department. [p. 113.]

Newcastle-under-Lyme Gas Department. [p. 114.]

Mainlaying and Welding.

Conway Gas Department. [p. 114.]

Pipes, &c.

Conway Gas Department. [p. 114.]

Tar.

Quorndon and Mountsorrel Gas, &c., Company. [p. 114.]

Trade Notes

Blackman Volume Fans.

We have received from Messrs. James Keith & Blackman Company, Ltd., a copy of their recently issued booklet dealing with the Blackman Volume Fans which have proved very successful in such processes as ventilation; drying; dust, fume, and steam removal; cooling; tea withering; refrigeration; cellulose operations, &c., &c.

E. C. & J. Keay (1926), Ltd.

For the purpose of reconstruction, Messrs. E. C. & J. Keay (1926), Ltd., Engineers and Ironfounders, Princes Chambers, Corporation Street, Birmingham 2, are now in members voluntary liquidation. The step is purely a domestic matter, constituting only a re-arrangement of the financial side of their business, and a new company under the old name of E. C. & J. Keay, Ltd., is to be opened up immediately.

Overseas Opportunities

Singapore.

H.M. Trade Commissioner at Singapore reports that the Singapore Municipality is calling for tenders, to be presented in London or Singapore by Aug. 12, 1935, for the supply of spun cast, cast iron spigot and socket or steel pipes and specials in sizes ranging from 3 in. to 12 in. diameter. (Ref. G.Y. 15,200.)

South Africa.

H.M. Trade Commissioner at Johannesburg reports that the Johannesburg City Council are calling for tenders, to be presented in Johannesburg by July 27, 1935, for the supply of material required in connection with the extension of the gas-works plant, including a three lift, 1½ million cu.ft. capacity gasholder, addition of extra lifts to two existing gasholders, and electrostatic tar precipitation equipment, capacity 6,000,000 cu.ft. of gas per diem.

Further details have been communicated by the Department to firms whose names are entered on its "Special Register."

Firms desirous of offering equipment of United Kingdom manufacture can obtain the further details of this call for tenders, together with particulars of the "Special Register" service of information, upon application to the Department of Overseas Trade, 35, Old Queen Street, London, S.W. 1. Reference number A.Y. 13,121 should be quoted.

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STOCK AND SHARE LIST

Official Quotations on the London and Provincial Stock Exchanges

Issue. £	Share	When ex-Dividend.	Dividends. Prev. Hf. Yr. % p.a.	Dividends. Last Hf. Yr. % p.a.	NAME.	Quotations, July 5.	Rise or Fall on Week.	Transactions, Lowest and Highest Prices During the Week.
1,551,868	Stk.	Mar. 11	7	7	Alliance & Dublin Ord. ...	130—140	...	137½—138½
374,000	,,	June 24	4	4	Do. 4 p.c. Deb. ...	90—100*	...	...
557,655	,,	Feb. 18	7	7	Barnet Ord. 7 p.c.	165—170	...	166
300,000	1	Apl. 8	1/4⅛	1/9⅛	Bombay, Ltd.	1⅛—1⅜	+1/6	32/-
178,480	Stk.	Feb. 18	9½	9½	Bournemouth sliding scale ...	225—235	+5	228—230
550,050	,,	,,	7	7	Do. 7 p.c. max. ...	168—173	...	170—172½
439,160	,,	,,	6	6	Do. 6 p.c. Pref. ...	147—152	...	148—151
50,000	,,	June 24	3	3	Do. 3 p.c. Deb. ...	85—90*	...	...
262,025	,,	,,	4	4	Do. 4 p.c. Deb. ...	103—108*	...	...
335,000	,,	,,	5	5	Do. 5 p.c. Deb. ...	123—128*	...	...
357,900	,,	Feb. 18	7½	7½	Brighton, &c., 6 p.c. Con. ...	173—178	...	...
649,955	,,	,,	6¾	6¾	Do. 5 p.c. Con. ...	153—158	...	...
205,500	,,	,,	6	6	Do. 6 p.c. B. Pref.	145—150	...	...
1,487,500	,,	Feb. 4	5	5	Bristol, 5 p.c. max.	121—123*a*	...	...
120,420	,,	June 7	4	4	Do. 1st 4 p.c. Deb. ...	100½—102·*a*	...	...
217,870	,,	,,	4	4	Do. 2nd 4 p.c. Deb. ...	100½—102½*a*	...	...
328,790	,,	,,	5	5	Do. 5 p.c. Deb.	123—125*a*	...	...
855,000	,,	Mar. 11	7	8	British Ord.	153—158	−1	153
100,000	,,	June 7	7	7	Do. 7 p.c. Pref.	160—165	...	...
350,000	,,	,,	5½	5½	Do. 5½ p.c. "B" Cum. Pref.	112—117	...	...
120,000	,,	,,	4	4	Do. 4 p.c. Red. Deb. ...	95—100	...	...
450,000	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	109—114	...	...
200,000	,,	,,	...	17/6	Do. 3½ p.c. Red. Deb. ...	99—101	...	...
100,000	10	22 May '33	6	4	Cape Town, Ltd.	1—3	...	...
100,000	10	6 Nov.'33	4½	4½	Do. 4½ p.c. Pref. ...	1—3	...	...
150,000	Stk.	June 24	4½	4½	Do. 4½ p.c. Deb. ...	83—88*	...	...
626,860	,,	Jan. 21	6	6	Cardiff Con. Ord.	130—135	...	...
237,860	,,	June 7	5	5	Do. 5 p.c. Red. Deb.	103—108	...	...
157,150	,,	Feb. 4	5	6½	Chester 5 p.c. Ord.	111—116*b*	...	...
98,936	1	Mar. 25	2/-	2/-	Colombo, Ltd., Ord.	1⅝—1⅞	...	...
24,500	1	,,	1/4½	1/4½	Do. 7 p.c. Pref. ...	20 6—22 6	...	...
609,204	1	Mar. 25	-/11·48	-/11·48	Colonial Gas Assn. Ltd. Ord.	20 6—22 6	...	21 7½
296,053	1	,,	1/3·30	1/3·30	Do. 8 p.c. Pref.	26 -—28 -	...	27 4½
1,775,005	Stk	Feb. 4	5	6	Commercial Ord.	104—109	−1	105—106
475,000	,,	June 7	3	3	Do. 3 p.c. Deb. ...	85—90*	...	87½—87½
286,344	,,	Feb. 18	5	5	Do. 5 p.c. Deb. ...	123—128	...	...
807,560	,,	Feb. 18	7	7	Croydon sliding scale... ...	155—160	...	...
569,590	,,	,,	5	5	Do. max. div.	115—120	+3	115—118
620,385	,,	June 24	5	5	Do. 5 p.c. Deb.	123—128*	...	125—127
542,270	,,	Feb. 18	7	10	Derby Con.	185—195*c*	...	...
55,000	,,	June 24	4	4	Do. 4 p.c. Deb.	100—105*c*	...	...
239,000	,,	Feb. 4	5	5	East Hull Ord. 5 p.c. ...	108—113	...	...
181,625	,,	Feb. 4	6	6	East Surrey Ord 5 p.c. ...	131—136	...	...
175,609	,,	June 7	5	5	Do. 5 p.c. Deb. ...	118—123	...	123
1,002,180	,,	Mar. 11	†	†7	European, Ltd.	170—180	...	175—180
19,313,481	,,	Feb. 4	5½	5½	Gas Light & Coke 4 p.c. Ord.	27 6—28 6*f*	...	27 9—28 1½
2,600,000	,,	,,	3½	3½	Do. 3½ p.c. max.	86—91	+1	89—91
4,477,106	,,	,,	4	4	Do. 4 p.c. Con. Pref. ...	106—111	...	109½—110¾
8,602,497	,,	June 7	3	3	Do. 3 p.c. Con. Deb. ...	87—92	...	88⅝—90⅝
3,642,770	,,	,,	5	5	Do. 5 p.c. Red. Deb. ...	113—118	...	...
3,500,000	,,	,,	4½	4½	Do. 4½ p.c. Red. Deb. ...	109—114	...	114
270,466	,,	Feb. 18	6	6	Harrogate New Cons. ...	135—140	...	...
140,000	1	Mar. 25	1 7/8	1 7/8	Hongkong & China, Ltd. ...	1¼—1½	...	...
213,200	Stk.	Feb. 18	6	6	Hornsey Con. 3½ p.c.... ...	128—138	...	136—136½
5,600,000	,,	May 13	10	14	Imperial Continental Cap. ...	215—220	...	216—218½
223,130	,,	Jan. 21	3½	3½	Do. 3½ p.c. Red. Debs.	91—96	...	96
285,242	,,	Feb. 18	8⅛	8⅛	Lea Bridge 5 p.c. Ord. ...	175—185	...	180
2,167,410	,,	Feb. 18	6	6	Liverpool 5 p.c. Ord.... ...	138—140*b*	+1	...
245,500	,,	June 7	5	5	Do. 5 p.c. Red. Pref. ...	105—110*b*	...	...
306,083	,,	Jan. 16	4	4	Do. 4 p.c. Deb.	104—107*b*	...	...
165,736	,,	Feb. 18	8	10	Maidstone 5 p.c. Cap. ...	185—195	...	...
63,480	,,	June 24	3	3	Do. 3 p.c. Deb. ...	82—87*	...	83
75,000	,,	May 27	†10	†10	Malta & Mediterranean ...	212—222*	..	220
392,000	—	Apl. 1	5½	5½	Metropolitan (of Melbourne) 5½ p.c. Red. Deb.	100—105	...	...
231,978	Stk.	Feb. 4	5	5	M. S. Utility "C" Cons. ...	110—115	...	...
818,657	,,	,,	4	4	Do. 4 p.c. Cons. Pref.	102—107	...	...
360,075	,,	June 24	4	4	Do. 4 p.c. Deb. ...	103—108*	...	...
148,955	,,	,,	5	†5	Do. 5 p.c. Deb. ...	123—128*	...	...
125,000	—	July 1	3½	3½	Do. 3½ p.c. Rd. Rg. Bds.	97—100*	−1	...
675,000	,,	June 24	†3	†3	Montevideo, Ltd.	48—58*	...	53—54
2,061,315	,,	Feb. 18	5	5½	Newcastle & Gateshead Con.	25/9—26/9*df*	..	...
682,856	,,	,,	4	4	Do. 4 p.c. Pref. ...	106—107*d*	...	...
776,706	,,	June 7	3½	3½	Do. 3½ p.c. Deb. ...	100—101*d*	...	...
277,285	,,	Oct. 8	5	5	Do. 5 p.c. Deb. '43 ...	105—107*d*	...	...
274,000	,,	Feb. 4	5	5	Newport (Mon.) 5 p.c. max....	115—120*a*	...	...
225,000	,,	Feb. 18	7½	7½	North Middlesex 6 p.c. Con.	165—175	...	...
396,160	,,	Feb. 4	5	5	Northampton 5 p.c. max. ...	105—110	...	...
300,000	,,	Apl. 29	†9	†7	Oriental, Ltd.	167—172	...	...
416,617	,,	June 7	8	8	Plym'th & Stonehouse 5 p.c.	162—167	...	...
504,416	,,	Feb. 4	8	8½	Portsm'th Con. Stk. 4 p.c. Std.	173—178	...	174
241,446	,,	,,	5	5	Do. 5 p.c. max. ...	110—115	...	...
114,000	,,	Jan. 21	5	5	Preston 5 p.c. Pref.	108—113	...	...
269,939	1	Apl. 8	...	...	Severn Val. Gas Cor. Ld. Ord.	21 9—22 9	...	21 9—22 6
302,781	1	Mar. 25	...	...	,, ,, 4½ p.c. Cum. Pref.	21 9—22 9	...	22 6
1,736,968	Stk.	Feb. 18	6	6	Sheffield Cons.	141—143*e*	−1	...
95,000	,,	June 24	4	4	Do. 4 p.c. Deb.	102—104*e*	...	...
133,201	,,	Feb. 18	8½	5	Shrewsbury 5 p.c. Ord. ...	142—147	...	143—145
90,000	10	May 27	‡3	‡3½	South African	3—4	...	3½
1,061,779	1	May 13	1 2½	1 2½	South East'n Gas Cn. Ld. Ord.	27/—29/-	...	28 -—28 9
845,016	1	Mar. 11	-/10½	-/10½	Do. 4½ p.c. Red. Cum. Pref.	22/—23/-	...	22 6—23/-
450,000	Stk.	Feb. 4	7/4/4	4	Do. 4 p.c. Red. Deb. ...	100—103	...	...
6,709,895	,,	Feb. 4	5	6½	South Met. Ord.	123—128	...	124½—127
1,135,812	,,	,,	6	6	Do. 6 p.c. Irred. Pf. ...	147—152	...	...
850,000	,,	,,	4	4	Do. 4 p.c. Irred. Pf. ...	104—109	...	108
1,895,445	,,	June 24	3	3	Do. 3 p.c. Deb. ...	86—91*	...	88 89
1,000,000	,,	Jan. 7	5	5	Do. 5 p.c. Red. Deb....	113—118	...	117
209,820	,,	Feb. 18	8½	8½	South Shields Con.	174—176*d*	...	...
1,543,795	,,	Feb. 18	6	6	South Suburban Ord 5 p.c. ...	130—135	...	130
512,825	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	122½—123½
500,000	,,	,,	4	4	Do. 4 p.c. Pref. ...	105—110	..	...
888,587	,,	June 7	5	5	Do. 5 p.c. Deb. ...	122—127	...	126½
250,000	,,	,,	4	4	Do. 4 p.c. Deb. ...	102—107	...	...
647,740	,,	Feb. 4	5	5	Southampt'n Ord. 5 p.c. max.	116—121	...	120
121,275	,,	June 7	4	4	Do. 4 p.c. Deb.	100—105	...	...
350,000	,,	Feb. 4	5½	5½	Swansea 5½ p.c. Red. Pref. ...	115—120	...	117—117½
200,000	,,	June 7	6½	6½	Do. 6½ p.c. Red. Deb. ...	98—103	...	...
1,076,490	,,	Feb. 18	6¾	6¾	Tottenham and District Ord.	148—153	...	149½—152
409,835	,,	,,	5½	5½	Do. 5½ p.c. Pref. ...	131—136	...	135
62,235	,,	,,	5	5	Do. 5 p.c. Pref. ...	120—125	...	...
199,005	,,	June 7	4	4	Do. 4 p.c. Deb. ...	101—106	...	103½—106
369,774	,,	Feb. 4	7	7	Uxbridge, &c., 5 p.c.	150—155	...	150—154
108,330	,,	,,	5	5	Do. 5 p.c. Pref. ...	118—123	...	120
1,326,700	,,	Feb. 4	7	7	Wandsworth Consolidated ...	155—160	...	154—159½
1,371,373	,,	,,	5	5	Do. 5 p.c. Pref. ...	121—126	...	121½—124
1,317,964	,,	June 7	5	5	Do. 5 p.c. Deb. ...	124—129	...	...
208,300	,,	,,	26/8	4	Do. 4 p.c. Deb. ...	102—107	...	...
158,400	,,	Feb. 18	5	6*g*	Winchester W.& G. 5 p.c. Con.	116—121	...	...

Quotations at :—*a*.—Bristol. *b*.—Liverpool. *c*.—Nottingham. *d*.—Newcastle. *e*.—Sheffield. *f*.—The quotation is per £1 of Stock. *g*.—Paid £3, including 10s. on account of back dividends. * Ex. div. † Paid free of income-tax. ‡ For year.

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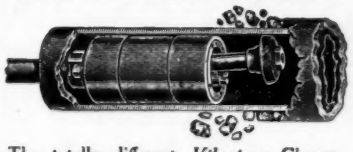
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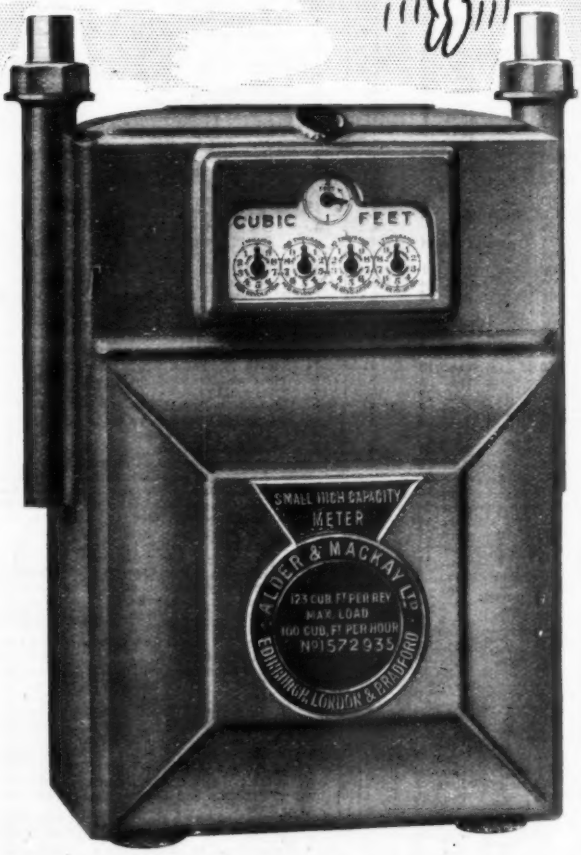

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APPLICATIONS are invited for the Position of EXECUTIVE OFFICER and SECRETARY of the National Organizations in Scotland. Commencing Salary, £450. Applicants must not exceed 45 years of age.

List of Duties and Conditions of Appointment may be obtained from the undersigned, with whom applications must be lodged not later than Monday, 22nd July, 1935.

J. W. NAPIER,
Gas Engineer.

Gas-Works,
Alloa.

COUNTY BOROUGH OF ROCHDALE.

(GAS DEPARTMENT.)

APPLICATIONS are invited for the Position of ASSISTANT CHEMIST.

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Salary £230, rising to £260 per Annum in increments of £10 per Annum.

Applications, endorsed "Assistant Chemist," to be sent to the undersigned not later than Wednesday, July 31, 1935.

By order,
WM. HENRY HICKSON,
Town Clerk.

Town Clerk's Office,
Town Hall,
Rochdale,
July 8, 1935.

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HARROGATE GAS COMPANY.

(DISTRIBUTION DEPARTMENT.)

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C. BATEMAN,
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Gas Office,
James Street,
Harrogate.

THE Whitehaven United Gas Company, Limited, require an Experienced GAS SALESMAN to Take Charge of New Showroom.

Apply, stating Age, Qualifications, Experience, and Salary required, to the ENGINEER AND MANAGER, GAS OFFICES, LOWTHER STREET, WHITEHAVEN.

TWO Gas Fitters required with Gas Works Training. Only those having obtained City and Guilds Final Certificate need apply. Preference given to applicants with driving experience.

Applications, stating Age, Experience, and Wages required, to R. J. H. CLARK, Engineer, THE PLYMOUTH AND STONEHOUSE GAS COMPANY, GAS-WORKS, COXSIDE, PLYMOUTH.

WANTED — Two First-Class Gas FITTERS. Must have had Experience in carrying out Gas-Heated Water Installations, including Plumbing. Only experienced men need apply. Good wages and permanent employment to suitable men.

Applications, stating Age, present Employment, and Wages required, to No. 8,548, "GAS JOURNAL," 11, BOLT COURT, FLEET STREET, E.C. 4.

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(*See also p. 690, June 12, and the "Gas Salesman."*)

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CONTRACTS OPEN.

BOROUGH OF DUKINFIELD.

(GAS DEPARTMENT.)

THE Gas Committee invite Tenders for the Supply of 12,000 Tons of BEST SCREENED GAS COAL, NUTS, and SLACK, to be delivered to the L.M.S. Railway Sidings, Dukinfield, during the period October, 1935, to July 31st, 1937, in such quantities as may be required.

Tender Forms may be obtained from the Gas Manager, Gas Office, Dukinfield, and to whom all inquiries should be addressed.

The Council reserve the right to fix the whole or part of the Contract with one or more Contractors. The lowest or any Contract will not necessarily be accepted.

Sealed Tenders, endorsed "Tenders for Coal," must be addressed to the Chairman, Gas Offices, Charles Street, Dukinfield, and be received here not later than Wednesday, July 24, 1935.

E. BARLOW,
Town Clerk.

July 5, 1935.

Continued on next page.

CASES FOR BINDING
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CONTRACTS OPEN.—*Continued.*

BOROUGH OF NEWCASTLE-UNDER-LYME.
(GAS DEPARTMENT.)

TENDERS FOR GAS FUEL.

THE Gas Committee invite Tenders for the Supply of GAS FUEL for their Gas-Works.

Sealed Tenders are to be delivered to J. Griffith, Esq., M.A., LL.B., Town Clerk's Office, Newcastle, not later than Five p.m., 17th July.

Particulars of quantities and Forms of Tender may be obtained from F. L. WIMHURST, GAS-WORKS, NEWCASTLE, STAFFS.

July 6, 1935.

THE QUORNDON AND MOUNTSORREL GAS, COKE, AND COAL COMPANY.

TAR.

PRICES are invited for the Purchase of all SURPLUS TAR, approximately 180 Tons, loaded free into Contractors' Tanks, Barrow-on-Soar Station (L.M. & S. Railway).

No Special Tender Forms are issued.

Tender, endorsed "Tender for Tar," to be delivered not later than first post July 16, 1935.

S. G. KEMP,
Engineer and Manager.

Quorn,
near Loughborough.

BOROUGH OF CONWAY.
(GAS DEPARTMENT.)

STEEL MAINS.

TENDERS are invited for approxi- mately 500 Yards of 8 In. STEEL MAINS SPECIALS.

Forms of Tender, Specification, and Conditions may be obtained from the Gas Engineer and Manager, Gas-Works, Conway.

Tenders must be sent in plain sealed envelopes and endorsed "Tender for Steel Mains," addressed to the undersigned and received not later than first post on July 17, 1935.

The Council do not bind themselves to accept the lowest or any Tender.

ARTHUR L. RALPHES,
Town Clerk.

Town Clerk's Office,
Municipal Buildings,
Conway,
July 3, 1935.

BOROUGH OF CONWAY.
(GAS DEPARTMENT.)

MAINLAYING.

TENDERS are invited from Experi- enced Mainlaying Contractors for the LAYING and WELDING of approximately 500 Yards of 8 In. STEEL MAINS, and the REMOVAL of approximately 500 Yards of 5 In. CAST-IRON MAINS.

Intending Contractors will be required to furnish particulars of similar Mainlaying Works carried out by themselves.

Forms of Tender, Specification, and Conditions may be obtained from the Gas Engineer and Manager, Gas-Works, Conway.

Tenders must be sent in plain sealed envelopes and endorsed "Tender for Mainlaying," addressed to the undersigned and received not later than first post on July 17, 1935.

The Council do not bind themselves to accept the lowest or any Tender.

ARTHUR L. RALPHES,
Town Clerk.

Town Clerk's Office,
Municipal Buildings,
Conway,
July 3, 1935.

BOROUGH OF WORKINGTON.
(GAS DEPARTMENT.)

TENDERS FOR GAS COAL.

THE Workington Town Council are prepared to receive TENDERS for the Supply of 10,500 Tons of GAS COAL, for delivery over the Twelve Months ending the 31st August, 1936.

Particulars and Forms of Tender may be obtained on application to Mr. Hedley Hoy, Engineer and Manager, Gas-Works, Workington.

The Council do not bind themselves to accept the lowest or any Tender, and reserve to themselves the right to accept the whole or any part of the Tender.

Tenders to be enclosed in plain sealed envelopes, endorsed "Tender for Gas Coal," to be addressed to the undersigned, and delivered at the Town Hall, Workington, not later than Twelve noon on Monday, 22nd July, 1935.

THOMAS JACKSON,
Town Clerk.

Town Hall,
Workington,
July 3, 1935.

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